

CITY OF LAS VEGAS



# Master Plan Transportation Trails Element

---

January 16, 2002

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## Transportation Trails Element of the City of Las Vegas Master Plan

Prepared by the  
Comprehensive Planning Division  
of the  
Planning and Development Department

Adopted January 16, 2002

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# Transportation Trails Element

## EXECUTIVE SUMMARY

The Transportation Trails Element, an element of The Las Vegas 2020 Master Plan, establishes standards, guidelines, objectives, policies and priorities for the location, development and maintenance of transportation trails in Las Vegas. The City initiated this effort to establish a multi-modal transportation system for pedestrians, bicyclists and persons with other modes of non-motorized vehicular travel. Establishment of this system will help ameliorate vehicular traffic congestion and other associated problems due to the phenomenal growth the City is experiencing. This plan by its adoption will be part of the Master Plan.

The City's existing trails system consists of four and one-half miles of public trails and four miles of privately constructed publicly accessible trails, a total of eight and one-half miles of trails. Compared to major metropolitan areas of other Southwestern communities, the City should have the equivalent of from 3.75 to 5.68 miles of trails per 100,000 residents. Since the City is projected to have an eventual population of 815,000 at full build-out, it should have from approximately 30 to 46 miles of trails at full build out. These trails will help mitigate the impact of vehicular traffic throughout the City and particularly within residential neighborhoods.

The Trails Element provides standards and guidelines for the establishment of two types of trails: (1) multi-use transportation trails and (2) on-street bicycle trails. The guidelines and standards for each type of trail are addressed.

Trails are located or aligned to form a necessary transportation system for non-motorized vehicular travel and for pedestrians. Accordingly, general rules applicable to streets and highways are also applicable to trails.

Where high volumes of non-motorized vehicular travel and pedestrians are expected or where on-street bicycle routes are unsafe, multi-use transportation trails should be provided. This plan establishes, as an objective, that multi-use trails be located such that the distance to a trail from any location does not exceed one mile. However, the spacing of multi-use trails depends more on existing and anticipated traffic volumes and traffic generation.

The Transportation Trails Element recommends that three groups eventually assume responsibility for maintenance of the trails system. The three groups include: a regional trails agency; a City department that would be organized to design, oversee, and help maintain all or part of the trails system; and private interest groups that are willing to assume responsibility for the maintenance of specific trails.



Based on the objectives and recommendations of the Transportation Trails Element, trails should be provided in conjunction with development by the developer. In addition, the ownership, maintenance and repair or replacement of the trails and trail segments should be as follows:

- Trails include paths and transition strips / landscaped corridors (see definition of terms). The trail path is to be established as a lot and dedicated to the City as a transportation trail path.
- The irrigated landscaped corridor(s) is to be owned by an adjacent maintenance or homeowners association.
- The transition strip is to be located within the street right-of-way.
- The trail, including the trail path and transition strip / landscaped corridor, is to be established by the developer.
- The trail, including the trail path and transition strip / landscaped corridor, is to be maintained and repaired by an adjacent maintenance or homeowners association.
- A public access easement is to extend across all private sections of the trail corridor, including all private street and drive intersections that the trail crosses, and be granted to the City.

Most trails within new developments are constructed by developers which allows the City to expend its limited resources in developing trails elsewhere. Consequently, the City should focus on constructing trail segments in existing and future development areas that are necessary to complete major sections of the trails system between developments. This may entail acquiring the necessary right-of-way and constructing some segments across undeveloped parcels and retrofitting other trail segments on development parcels.



# TRANSPORTATION TRAILS ELEMENT

## INTRODUCTION

### PURPOSE

This element of The Las Vegas 2020 Master Plan (“Master Plan”) establishes standards, guidelines, objectives, policies and priorities for the location, development and maintenance of transportation trails in Las Vegas. The City of Las Vegas (“City”) initiated this effort to establish a multi-modal transportation system for pedestrians, bicyclists and persons with other modes of non-motorized vehicular travel. This plan by its adoption will be incorporated into the transportation plan element of the Master Plan.

This plan document analyzes the existing trails system and delineates opportunities to extend the system during the next two decades. The plan provides the standards, guidelines, objectives, and priorities for the development of a complete transportation trails system.

The transportation trails addressed in this document are distinguished from those trails identified as recreation trails which are intended primarily for recreation purposes. Recreation trails are addressed in a separate document entitled the “Recreation Trails Element” which is incorporated into the recreation plan of the Master Plan.

### TRAIL BENEFITS

The National Park Service’s Rivers, Trails, and Conservation Assistance Program (Rivers & Trails) and the Rail-to-Trails Conservancy are two of the largest organizations dedicated to trails. Studies by these organizations and others have found that a trails system benefits the community in the following ways:

- Provides an important transportation corridor
- Contributes to the conservation of natural resources
- Provides a safe means for non-vehicular travel
- Potentially increases the value of property
- Provides a community recreation resource
- Promotes health and fitness
- Contributes to the preservation of aesthetic values
- Enhances economic opportunities
- Minimizes crime
- Serves as a buffer



*Boulder City, Nevada  
Trail*



The phenomenal growth in Las Vegas has led to a plethora of problems, including increased traffic congestion, safety issues, aesthetic concerns and air pollution. Because trails provide an important transportation corridor for non-polluting modes of non-vehicular travel, they undeniably are an important part of the solution to relieving congestion, increasing safety and conserving natural resources.

The Greenspun College of Urban Affairs of the University of Nevada, Las Vegas and the Department of Planning and Development of the City undertook a quality of life survey of 401 residents in the Las Vegas Valley in February 1999. A report entitled *The Quality of Life in Las Vegas* sets forth the conclusions from the survey. Twenty-two indicators were used to determine "quality of life." Respondents considered eleven indicators more important than "air quality" (Page 14). Not surprisingly, 82.2 percent of the population rated air quality as fair to very bad (page 17), and only three indicators had worse ratings than air quality (page 20). Approximately 65.2 percent of the respondents indicated they would be willing to increase taxes to improve air quality, the highest response to any indicator (page 50). Clearly, residents recognize the significant problem the Valley is experiencing with air pollution, resulting primarily from vehicular emissions, and are willing to pay for improved air quality for a higher quality of living. Since trails are provided for non-vehicular travel, the use of trails as an alternative mode of transportation results in an opportunity savings toward the cost of air pollution control with no emissions.

The separation of walkways from streets and other vehicular travel surfaces promotes a safer environment for non-vehicular travel. This is particularly important for children who would use the trail system for travel to and from school.

Rails-to-Trails Conservancy is a 13-year-old nonprofit organization dedicated to enriching America's communities and countryside by creating a nationwide network of public trails from former rail lines and connecting corridors. The Rivers, Trails, and Conservation Assistance Program (Rivers & Trails) serves as a community resource of the National Park Service. It provides expertise and valuable on-the-ground technical assistance from strategic consultation and partnership development to service as a liaison with other government agencies. These two agencies conducted an extensive study to examine the benefits and impacts of trails, the first to systematically examine both the trail users and nearby property owners of the same trails. The results of the study are reported in a document entitled *The Impacts of Rail-Trails* published in July 1992.

As reported in the study's Findings, "... overall, trail neighbors had experienced relatively few problems as a result of the trails ... " It goes on to say, "... the landowners reported that the trails had not adversely affected the desirability or values of their properties ... the majority of owners felt the presence of the trail would make their properties sell more easily and at increased values." A vast majority of real estate professionals interviewed "... felt that the trails had no negative effect on property sales and no effect on property values adjacent to or near the trails." Conversely, many realtors felt that the



trails actually increase property values. Those that reported a positive effect cited reasons of health, and fitness, the aesthetic beauty of the trail system, and added open space.

While in some instances higher property resale values were noted in the study, it was reported that trails generate significant levels of economic activity. Many trail-related and trailside businesses, including restaurants and concession stands, recognized the purchasing power of cyclists, walkers, runners and others and oriented their merchandise, advertising and service toward trail users.

Important to the community's viability and enhancement of economic opportunities is the relationship to the community's quality of life. Trails provide a lifestyle amenity that increases the desirability of Las Vegas as a place to live. Quality of life amenities are important attributes businesses and industries look for in making location decisions.

Research indicates that crime rates actually fall because of increased visibility of criminals to residences along the trail system. In another study by the Rails-to-Trails Conservancy and Rivers & Trails entitled Rail-Trails & Safe Communities, data showed that crime significantly decreased. While FBI national crime statistics for muggings in 1995 showed a rate of 335 per 100,000 people, the study, published in 1996, showed a crime rate of 0.53 per 100,000 people along trail systems. These figures were based on 7,000 miles of trails and 45 million annual users.

Trails also provide the benefit of a buffer between potentially incompatible land uses. As a transition between uses inside and outside of Town Center, the group advocates the location of trails to separate proposed commercial development from residential development. Used in this manner, trails with landscaped corridors provide separation in the form of open space.

## REGIONAL TRANSPORTATION COMMISSION

The Regional Transportation Commission (RTC) is in the process of developing a county wide trails plan termed the Alternative Mode Transportation Master Plan. The RTC's plan will include design standards for the construction of different types of trails, criteria for their location, and uniform standards for signage and trail amenities. Its goal is to establish a valley-wide plan with uniform standards endorsed by all the agencies and mutual interest groups in the Las Vegas Valley (Valley).

The Transportation Trails Element establishes the City's trail goals, policies and standards. The regional plan will take into account the trail alignments and standards of this Element so optimum locations for interconnecting trails in Las Vegas with those in adjoining areas can be identified. The City supports regional efforts, and the City's guidelines will meet regional guidelines whenever appropriate.



*Trails and landscaped corridors provide separation in the form of open space*

## ENABLING LEGISLATION

Sections 278.150 through Section 278.230 of the Nevada Revised Statutes contain the enabling legislation for the development and adoption of a master plan. Section 278.160 lists the specific elements of a master plan that may be addressed, including a “transportation plan” and a “transit plan.” According to subsection (p), a transportation plan is to show “. . . a comprehensive transportation system, including locations of rights-of-way, terminals, viaducts and grade separations.” Trails provide a transportation network for multi-model non-vehicular travel throughout the city.

The Nevada Legislature in the 71st Session passed AB 182, which among other actions, expanded the subjects that must be addressed in a master plan. In this bill, the description of subsection (q) “transit plan” was amended to include a proposed “multimodal” system of transit lines, including “paths for bicycles and pedestrians.” Trails are not generally construed to be transit oriented, but this sets forth enabling legislation for the inclusion of trails in the master plan.

The City has an adopted master plan which is referred to as the City of Las Vegas General Plan (“General Plan”). The Las Vegas 2020 Master Plan which replaces parts of the General Plan was adopted in September of 2000. Both plans constitute a master plan as referenced in the Nevada Revised Statutes and will be discussed in the following sections.

There are two titles of the Las Vegas Municipal Code that address trails. One is Title 13 that provides for “streets, sidewalks and public places” and the other is Title 18 that sets forth provisions for public improvements in subdivisions.

Chapter 13.56 of the Las Vegas Municipal Code sets forth the requirements for the construction, maintenance and repair of sidewalks and “transition strips.” Property owners abutting the public right-of-way along and within which sidewalks and transition strips are located are responsible for their construction, repair and maintenance. Trail paths function as and are in lieu of sidewalks and the trail landscaped corridors are synonymous with transition strips. Accordingly, this chapter of the Municipal Code should be amended to include trails, so trail construction, repair and maintenance is made the responsibility of abutting property owners.

While none of the legislation above specifically references trails, Title 18 includes provisions for the construction of trails. In particular, proposed Section 18.08.185 states: “Trails shall be required in accordance with City standards, regulations, plans and policies.” Other sections of this title provide for landscaping plans along street corridors; the scheduling of improvements; the installation of trails, including the installation of trail paths and landscaped corridors; and the maintenance of trails.



Within new developments, whether in new areas or infill areas, Title 18 places the responsibility for the construction and maintenance of trails on homeowners associations or other maintenance organizations. The City may require as a condition of approval the dedication of the right-of-way for a trail and its construction by a developer whose property the trail crosses.

A multi-use transportation trail can be an important transportation system in providing for non-vehicular access throughout the city. It benefits the development through which it crosses as a substitute for sidewalks that otherwise would be required.

## CITY OF LAS VEGAS GENERAL PLAN

The General Plan was adopted April 1, 1992 and updated December 7, 1994. The General Plan contains a "Circulation" element in Chapter V. This chapter incorporates in one chapter both the street and highways plan and transportation plan elements referenced in the NRS. Section 5.2 addresses a "multi-modal approach to transportation planning," stating:

*A comprehensive circulation system offers several modal choices ranging from a variety of transit alternatives to pedestrian walkways (emphasis added). Currently, the private automobile is the preferred mode of transportation in the Las Vegas Valley. Mass transit is severely limited at best. A focus on alternatives to the automobile is needed and appropriate areas of interest include . . .*

One of the areas of interest specifically referenced is a "multi-use trail system" stating:

*A multi-use trails system (bicycle, pedestrian and equestrian trails) is another important element of a successful multi-modal circulation system. Such a multi-use trail system will utilize dedicated rights-of-way or easements to connect other existing trails systems . . .*

A portion of the 1992 General Plan was amended in 1997 to include the Centennial Hills Sector Plan (previously known as the Northwest Sector Plan) that was later updated in 1999. At that time, several agencies, interest groups and homeowners associations met with City staff to revisit trails issues. Based on these discussions, amendments to the Centennial Hills Plan were prepared and adopted by the City that recommended various locations for multi-use trails in addition to equestrian trails in the northwest part of the community. The location of these trails is illustrated on Map #1 (also referenced as Map #7 in the Centennial Hills Sector Plan).

A complete trails system should include trails for the city as a whole. This Transportation Trails Element amends the General Plan to extend the trails system to connect with trails in the southeast and southwest parts of the city.



*Newly adopted policies call for all downtown parks, open spaces and major activities to be linked with non-vehicular corridors or routes*



## THE LAS VEGAS 2020 MASTER PLAN

The Las Vegas 2020 Master Plan replaces parts of the General Plan and contains goals, objectives and policies pertaining to trails. These are enumerated as follows:

**GOAL 1:** The Downtown area will emerge as the preeminent hub of business, residential, government, tourism and gaming activities in the City of Las Vegas and as a major hub of such activities in the Las Vegas Valley.

**OBJECTIVE 1.2:** To improve the livability of the Downtown through the creation of a series of safe, attractive and interesting public open spaces and non-vehicular routes to connect these open spaces and other major Downtown activities.

**POLICY 1.2.3:** That all Downtown parks and open spaces be linked with non-vehicular corridors or routes. These routes may incorporate a theme, and should be readily identifiable through sidewalk treatments, signage, lighting, landscaping and other techniques. Enhanced streetscapes should be developed along selected corridors. The intent is to foster a safe, pleasant and convenient pedestrian environment. The City will promote the use of public/private partnerships to develop Downtown open space.

**GOAL 3:** Newly developing areas of the city will contain adequate educational facilities, and recreational and open space and be linked to major employment centers by mass transit, including buses, and by trails.

**OBJECTIVE 3.6:** To ensure that adequate amounts of park space and trail systems are designated and developed to meet or exceed national standards and standards established in the Master Plan Parks Element.

**POLICY 3.6.7:** that the City encourage the development of parks that link with and take advantage of trail and pedestrian/bike traffic plans.

**POLICY 3.6.8:** That the City coordinate the planning, development and construction of a Valley-wide trail system with other Las Vegas Valley entities.

**GOAL 7:** Issues of regional significance, requiring the City of Las Vegas to coordinate with other government entities and agencies within the Valley, will be addressed in a timely fashion.

**OBJECTIVE 7.1:** To ensure that the natural resources of the City, particularly those that directly support an enhanced quality of life for its residents, are protected.

**POLICY 7.1.9:** that the City coordinate the planning, development and construction of a Valley-wide trail system with other Las Vegas Valley entities.

**OBJECTIVE 7.2:** To ensure that arroyos, washes and water courses throughout the City are integrated with urban development in a manner that protects the integrity of the watershed and minimizes erosion.

**POLICY 7.2.3:** That the areas along the edges of hard-lined flood control facilities and along natural drainage courses be utilized as area for public trails and walkways, with landscaping and other features which enhance the appearance of these areas.

The goals, objectives and policies of The Las Vegas 2020 Master Plan are incorporated in the objectives for the Transportation Trails Element.





# Map No. 1

## City of Las Vegas CENTENNIAL HILLS SECTOR Existing and Proposed Trail Alignments

- EXISTING AND PROPOSED PARK, RECREATION, AND OPEN SPACE
- EXISTING AND PROPOSED PUBLIC FACILITY
- PROPOSED BELTWAY TRAIL SYSTEM BY CLARK COUNTY
- TRAIL ALIGNMENTS - MULTI-USE (NON-EQUESTRIAN) (20 FT.)
- EXISTING TRAIL ALIGNMENTS - MULTI-USE (25 FT.)
- PROPOSED TRAIL ALIGNMENTS - MULTI-USE (25 FT.)
- PROPOSED TRAIL ALIGNMENTS - MULTI-USE (30 FT.)
- TRAIL ALIGNMENTS - EQUESTRIAN ONLY (20 FT.)
- TRAIL ALIGNMENTS - RTC BIKE ROUTE
- PROPOSED CITY OF LAS VEGAS BIKE ROUTES
- TRAIL ALIGNMENTS - TRANSMISSION CORRIDOR
- PROPOSED BELTWAY ALIGNMENT (RIGHT OF WAY)

### NOTES:

1. Trail corridors (permanent) are to be located outside of public street right-of-ways and are typically located adjacent to street corridors. 5 feet of the public street right-of-way may be used as a part of the total width as required above, if public sidewalk is not to be built at the back of curb.
2. Use of unimproved right-of-way areas as temporary trail corridors is acceptable until the unimproved right-of-way is utilized for another purpose.
3. Trail corridors are public-use, multi-modal facilities including non-equestrian and equestrian users (unless otherwise noted in the legend above). Non-equestrian users are non-motorized and include: bikers, walkers, joggers, skaters, and physically challenged persons.

SOURCE: The Departments of Public Works and Parks & Leisure Activities

PLANNING &  
DEVELOPMENT  
CITY OF LAS VEGAS  
Development  
Services Center

Plotted: December 16, 2002  
GIS maps are normally produced only to meet the needs of the City. Due to continuous development activity this map is for reference only.  
Geographic Information System  
Comprehensive Planning  
702.229.6022



SUPERSEDED BY MAP NO. 2



## METHODOLOGY

To establish a complete trails system, several components must be addressed, including definitions and standards; criteria and objectives; an assessment of anticipated needs; and an implementation strategy for developing the trails system.

For trails to be functional, they should meet the design standards of the American Association of State Highway and Transportation Officials (AASHTO) and reflect the local area's experience with existing trails. The AASHTO is the leading national organization on standards for multi-use trail construction. For the most part, the trails system is intended to parallel existing and planned roadway corridors. An implementation strategy for establishing a trails system identifies the funding sources and organizational changes necessary to construct and maintain the trail system for those portions not constructed as part of development.

## PLANNING PROCESS

The planning process was initiated with a studio or charrette held on August 11, 1999. Staff from several departments met to discuss goals and objectives for a trails plan, addressing applicable standards and deficiencies in the present system. The planning process eventually culminated in the development of two trails plans: the Transportation Trails Element and the Recreation Trails Element.

Considerable input was provided by a large number of groups and persons during the development of a trails plan. A Technical Advisory Committee (TAC), composed of various staff members from several departments, was formed to provide input primarily at the earlier stages of the process on the dates noted:

- Lied Middle School, 9/7/99
- Rafael Rivera Community Center, 9/8/99
- Johnson Middle School, 9/9/99
- West Las Vegas Arts Center, 9/14/99
- West Charleston Library, 9/23/99
- Rafael Rivera Community Center, 11/9/99

After a draft of a trails plan was prepared, the draft was mailed out on February 1, 2001 to key persons and organizations for input on the draft prior to February 16. Numerous comments were received and incorporated into the draft. The period for review was extended to May 18, 2001 for those persons who did not respond. Additional comments were addressed in a final draft of a plan.



*Trails can create a buffer zone between potentially incompatible uses*

After the final draft of a trails plan was completed, additional neighborhood meetings, one in each ward, were held to derive input. These meetings were located in the following places on the dates noted:

- Ruthe Deskin Elementary School, 5/14/01 (Ward 1)
- O.K. Adcock Elementary School, 5/15/01 (Ward 1)
- Oran Gragson Elementary School, 5/16/01 (Ward 3)
- M.J. Christensen Elementary School, 5/17/01 (Ward 2)
- West Las Vegas Arts Center, 5/21/01 (Ward 5)
- Betsy Rhodes Elementary School, 5/23/01 (Ward 6)

Prior to each meeting, all registered neighborhood associations were notified by mail and an advertisement was placed in the *Las Vegas Review Journal*.

The final draft of a trails plan resulted in the development of two plans: one entitled the Transportation Trails Element for transportation trails and the other entitled the Recreation trails Element for recreation trails. After adoption of the two plans by the Planning Commission on October 4, 2001, they were presented to the Southern Nevada Regional Planning Coalition for review and comment. Following adoption of the two plans by the Planning Commission and endorsement of the plans by the City Council, the Transportation Trails Element will be submitted to the Regional Transportation Commission for its adoption and subsequent incorporation in the Alternative Transportation Mode Master Plan.

## TERMS

Terms used in this plan document are for the most part based on definitions of the American Association of State Highway and Transportation Officials (AASHTO).

**Bicycle path:** A path intended primarily for bicycles that is physically separated from motorized vehicular traffic. Pedestrians, skaters, wheelchair users, joggers, and other non-motorized users may also use bicycle paths. For this reason, a bicycle path is also referred to as a shared use path.

**Bicycle lane:** A bikeway trail consisting of a portion of the roadway, a minimum of four feet wide (excluding curb and gutter), that has been designated by striping, signing, and pavement markings for the preferential or exclusive use of bicyclists traveling the same direction as vehicular traffic.

**Bicycle route:** A bikeway trail along a roadway that is designated by signage for use of bicyclists but shared with vehicular traffic.

**Path:** A prepared surface within a multi-use trail that is physically separated from vehicular roadways. A path is intended to be used by bicyclists and other users of non-motorized vehicles and by pedestrians. A path differs from a sidewalk only in its intended use.





**Shoulder:** The portion of a roadway contiguous with the traveled way for accommodation of stopped vehicles, for emergency use and for lateral support of the sub base, base and surface courses.

**Sidewalk:** That portion of the public right-of-way which has been improved for pedestrian traffic (13.56.020 LVMC). A sidewalk differs from a trail path only in its intended use.

**Trail:** A designated route for persons driving or riding non-motorized vehicles, for pedestrians, and for other trail users. There are two major types of trails: transportation trails and recreation trails. A multi-use transportation trail includes a path established as a dedicated transportation trail path and landscaped corridors (see Exhibit 1). An on-street trail is intended for bicyclists and is referred to as a bikeway trail and located on the street surface.

**Trail, bikeway:** A segment of roadway intended for bicyclists. There are two types: a bicycle route and bicycle lane.

**Trail, multi-use transportation:** A transportation trail intended to be used and shared by bicyclists and persons on other non-motorized vehicles and for pedestrians,

**Trail, recreation:** A trail intended to be used for recreation purposes. A recreation trail may be characterized as a path which begins and ends in approximately the same locality, such as in a park or subdivision; it may constitute a path that is incorporated in a cultural or societal experience; or it may provide access to a destination that is generally oriented for recreation purposes.

**Trail, transportation:** A trail intended to be used for transportation purposes. A transportation trail may be characterized as a trail that provides access from one part of the community to another.

**Transition strip:** The unimproved (unpaved) portion of the public right-of-way, including any vegetation growing thereon, lying between the back of the curb, or in the event there is not a curb, then that portion between the edge of the paved street and the property line of the property abutting the public right-of-way (13.56.020 LVMC).

**Wide curb lane:** A right-hand, marked lane of a roadway that is typically 14 feet wide (excluding curb and gutter) and used to better accommodate both bicycles and motor vehicles in the same lane.

## EXISTING TRAILS

### LOCATION AND INVENTORY

The City's existing off-street trails system consists of four and one-half miles of public trails and four miles of privately constructed, publicly accessible trails, a total of eight and one-half miles of trails. Major trail routes include:

- A trail along I-515 from 6th Street to Charleston Avenue;
- A trail along U.S. 95 from Rainbow Boulevard to Decatur Boulevard;
- The Summerlin trails;
- The Pueblo trail;
- A trail along Horse Drive from Durango Drive to El Capitan Way; and
- A trail along Pioneer Way from Severance Drive to Elkhorn Road.

These six trails, a greater number of which are located in the southeast and southwest portions of the community, provide the starting point for the development of a community-wide trails system. The remaining trails are under construction or planned for construction in the northwest part of the community, north of Cheyenne Avenue.

Existing on-street bikeways have not been determined. The Alternative Mode Transportation Master Plan under preparation by the RTC will quantify both the streets with bike routes and bike lanes.

**TABLE 1. MILES OF DEVELOPED TRAILS**

CITIES	REGIONAL POPULATION	MILES OF DEVELOPED TRAILS	MILES/100,000 POPULATION
Las Vegas	1,321,319	Not Available	Not Available
Denver	2,286,975	130	5.68
Phoenix	2,913,475	128	4.39
Salt Lake City	1,360,159	51	3.75

## EXISTING USAGE

Due to the very small amount of existing trails and the poor accessibility to those that do exist, no counts of usage have been made. As more trails are constructed, it is anticipated there will be more accurate counts.

## COMPARISONS WITH OTHER SOUTHWESTERN CITIES

Clarion Associates, LLC, a consultant for the Southern Nevada Regional Planning Coalition, prepared a regional policy plan presentation on comparative regional indicators, i.e. how the Valley compares to other major metropolitan areas. One such comparison is miles of developed trails for the regions of other Southwestern communities. This information is shown in Table #1. It should be noted that the total miles of trails for the entire Valley is not known, preventing a determination of the miles per 100,000 population locally.

From the table, it is obvious that the Denver region has more miles of trails at 5.68 miles per 100,000 population than any other region surveyed with available data. Las Vegas is projected to have an eventual population of 815,000 at full build-out. If the City were to have the equivalent of from 3.75 to 5.68 miles of trails per 100,000 residents, then a goal of 30.56 to 46.29 miles of trails at full build out seems reasonable, based on such comparisons.

Another comparison made by Clarion Associates, LLC is the number of vehicle miles traveled per the population in other metropolitan areas. These data are shown in Table #2.

As shown in the table, the Salt Lake City region had the lowest

**TABLE 2. TRANSPORTATION/MASS TRANSIT (1999)**

CITIES	VEHICLE MILES TRAVELED (MILLIONS)	VMT/POPULATION
Las Vegas	35.8	27.1
Denver	57.7	25.2
Phoenix	58	19.9
Salt Lake City	30	22.1
San Diego	68	23.1

number of vehicle miles traveled (VMT) at 30 million, i.e. there is less distance traveled by vehicle in this region than in other areas. The San Diego region had the highest VMT.

When the VMT is compared to the population, the Salt Lake City region had the second to the lowest mileage or fewest miles traveled per person. Conversely, the Las Vegas Valley had the most VMT per person, i.e. the lowest number of persons per vehicle traveling the most miles. One way to reduce vehicular emissions in the Las Vegas Valley and the VMT per person is to encourage non-vehicular travel.

## TRAIL OBJECTIVES AND CRITERIA

To formulate objectives and criteria for the establishment of a trails system and to determine appropriate locations for trail links based upon these objectives and criteria, views were solicited from a number of different sources. A technical advisory committee composed of members of the City staff and an advisory committee composed of persons from various agencies with an interest in trails met on several occasions to exchange views. Various other groups, including the development community, participated in the development of goals and objectives for the 2020 Master Plan which are incorporated in this document.

### OBJECTIVES AND CRITERIA

- That the design standards presented in this plan control, unless it is demonstrated by substantial evidence that there is a more suitable alternative;
- That American Association of Street and Highway Transportation Officials (AASHTO) standards be used for the design and configuration of trails where specific situations are not readily adaptable to the general standards of this plan;
- That the Manual on Uniform Traffic Control Devices (MUTCD) be used for signage and route designations where the standards of this plan do not apply to specific situations;
- That multi-use trails be located so travel to a trail does not exceed one mile;
- That the City establish a trails system and remove hazards to on-street bicycle traffic;
- That traffic calming-diverting and traffic slowing measures for on-street bicycle routes be implemented and maintained where possible or feasible;
- That additional operating space for on-street bicycle routes be provided wherever necessary and feasible;

- That a signage program be established to systematically install signs over a period of time to designate multi-use trail routes;
- That existing and future parks be integrated with the trails system and provide appropriate trail heads with the proper conveniences;
- That the City coordinate the planning, development and construction of a Valley-wide trail system with other Las Vegas Valley entities.
- That the Trails Element be presented to the Regional Transportation Commission for adoption.
- That all Downtown parks and open spaces be linked with non-vehicular corridors or routes to foster a safe, pleasant and convenient pedestrian environment.
- That educational facilities, recreational and open space and major employment centers in newly developing areas of the City be linked by trails.
- That the areas along the edges of hard-lined flood control facilities and along natural drainage courses be used, where appropriate, as areas for trails with landscaping and other features which enhance the appearance of these areas.
- That trails be developed in recognition of a desert climate by incorporating shade and wind breaks in the trail system.
- That public education in the use of trails be promoted.

## TRAIL CLASSIFICATIONS AND STANDARDS

The Transportation Trails Element provides standards and guidelines for the establishment of two major types of trails: (1) multi-use transportation trails and (2) on-street bicycle trails. These trail types are important from the standpoint of providing for alternative modes of transportation. The guidelines and standards for each type of trail are as follows.

### MULTI-USE TRAILS

In transportation planning, off-street bicycle facilities or bicycle paths are referred to as multi-use trails, or shared use trails, because any path that is open for public use is likely to be popular with walkers, joggers, in-line skaters, pet owners, wheelchair users, and others, as well as bicyclists. By either name, these facilities typically have paved trail paths separated from the roadway and designed for the exclusive use of bicyclists, pedestrians, and other users of non-motorized vehicles.



*Bicycle clubs sponsor “Ride to Work Day” statewide to help raise awareness for the need for alternate forms of transportation to help protect the environment as well as promote a healthy lifestyle*

For safety reasons, sidewalks immediately adjacent to a roadway are not recommended for designation as multi-use trails. Off-street multi-use trails should be designed as grade-separated facilities in conjunction with bridges at major highway crossings, including Interstate Highway 15, U.S. Highway 95, Interstate 515, Summerlin Parkway, and the Beltway. Care must be taken to design appropriate transition areas between off-street multi-use trails and on-street bikeways that include bicycle lanes, wide curb lanes, paved shoulders, or general shared roadways.

Exhibit #1 illustrates the layout of a typical multi-use trail. The total width of this trail is 20 feet. A bi-directional shared path within the trail has a Portland cement concrete surface 10 feet wide, midway between two irrigated landscaped corridors. Variations to the location of the path within the trail may be necessary to allow for problems with drainage or physical features. A meandering path alignment within the trail also may add visual acuity and allow for a better alignment around street lights and other infrastructure. Except along bus turnout lanes, no trail path should be located closer than two feet to the edge of the trail.

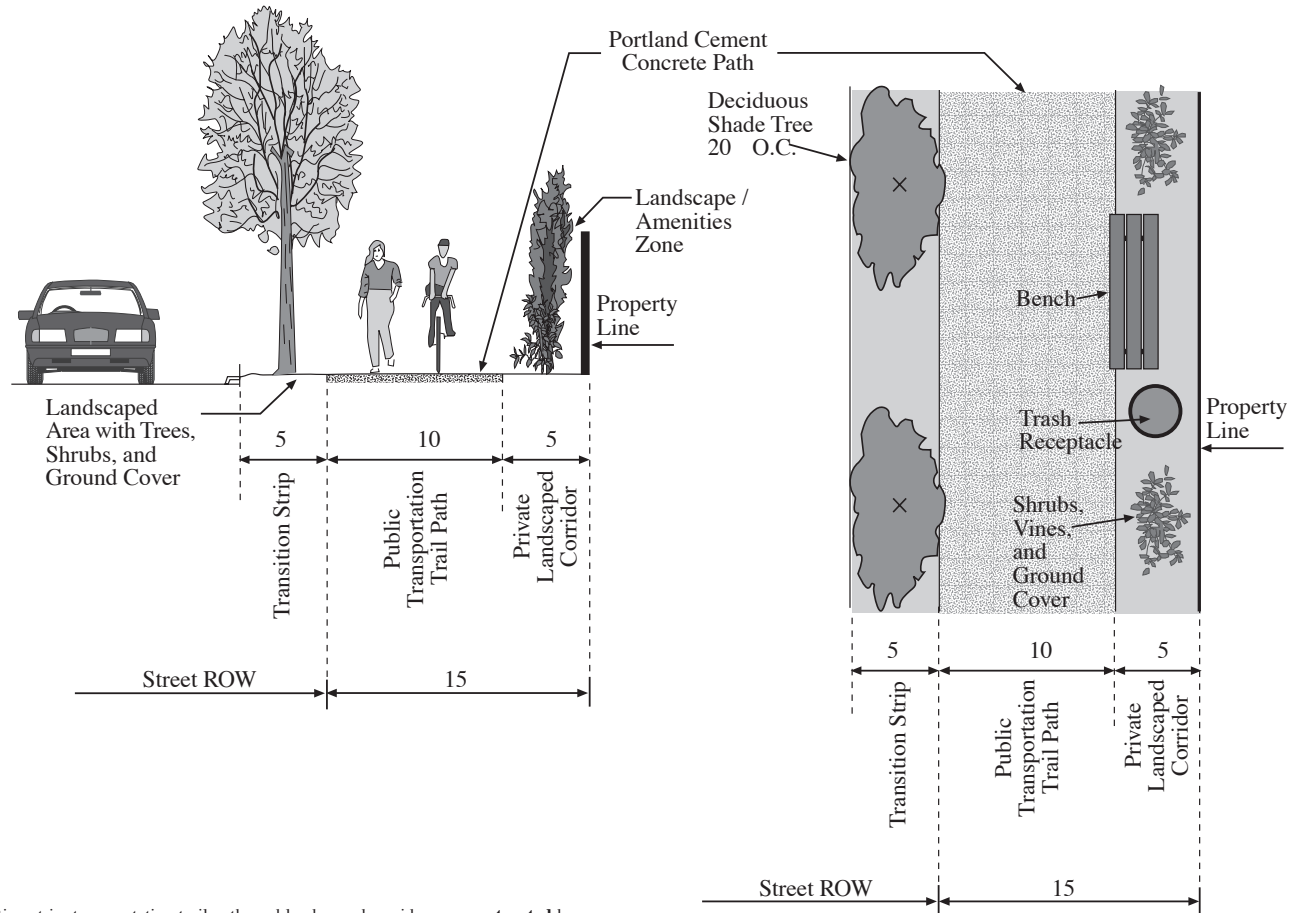
The Landscaped corridors provide separation and shade and are planted with trees spaced 20 feet on-center on one or both sides of the path. The direction of the sun should be a factor in determining the side of the path on which trees are located. This spacing may be varied depending upon the varieties of trees used and the particular landscaping scheme. A narrow, conical type tree with short branches should be used or other trees kept trimmed where interference to trail users may result.

Lighting is an important component of a trail system for safety reasons. Where trails are located along streets, street lighting may be sufficient in most instances. To provide additional lighting, backside luminaries placed on light poles should be considered. In residential districts, backside luminaries that direct light downward should be used so excessive lighting is not projected on adjoining residents.

Where trails are not located along street corridors and where direct or ambient lighting is not present or proposed with sufficient intensity to provide adequate lighting, lighting should be supplied. However, it is important that lights be placed at ground level or on light standards that are low enough to prevent a disturbance to adjoining residential properties. As with backside luminaries on street lights, a type that directs the light downward should be used. If adjacent perimeter walls exist, the placement of lighting on the walls is a preferred alternative. The lights should be spaced along the trail path no less than one light for each 150 feet.

Multi-use trails, including the trail paths and irrigated landscaped corridors, typically are located within trail easements and are maintained, including irrigation, by a maintenance organization such as a homeowners association. The landscaped areas flanking the trail paths are located on private property within common lots while the paths are dedicated to the City as transportation trail paths.

# Exhibit 1 Multi-Use Transportation Trail



## Notes:

The transition strip, transportation trail path, and landscaped corridor are **constructed** by a developer; the landscaped corridor is established as a common lot and **owned** by an adjacent property owner or homeowners association; the transportation trail path is **dedicated** to the City; the transition strip, transportation trail path, and landscaped corridor are **maintained** by an adjacent maintenance or homeowners association.

Adopted January 16, 2002



Each individual multi-use trail must be designed based upon site-specific subgrade conditions. As a general rule, multi-use trail paths should be designed with a peak load of 3,000 psi to support the weight of a light maintenance truck or ambulance, and have a cross slope with no more than a 0.3 foot to 10 foot grade directed toward the street or the direction of drainage flow. For other design standards, those referenced by the American Association of State Highway and Transportation Officials (AASHTO) should be used [see the publication entitled “Guide for the Development of Bicycle Facilities” (1999)].

Minimum widths for multi-use trail paths are generally expected to be 10 feet. Per the AASHTO, an eight-foot width is adequate only where the following conditions prevail:

- Bicycle traffic is expected to be low, even on peak days or during peak hours;
- Pedestrian use of the facility is not expected to be more than occasional;
- There will be good horizontal and vertical alignment providing safe and frequent passing opportunities; and
- The path will not be subjected to maintenance vehicle loading conditions that would cause pavement edge damage.

In some cases, multi-use trail paths may need to be even wider than 10 feet to accommodate passing situations for different users traveling at higher speeds or different speeds. It is recommended that where significant trail traffic of 300 or more users per hour during peak periods is anticipated, the width should be 12 feet. Consideration should be given to wider trail paths in some rural areas and in many developed urban areas.

As discussed by the AASHTO, entrances to multi-use trails often need some form of physical barrier to prevent unauthorized motor vehicles from using the facilities. The first of two alternatives presented in the AASHTO Guide for the Development of Bicycle Facilities involves installing posts or bollards in the center and at either edge of the trail. A five-foot minimum spacing is recommended, as this design allows passage by pedestrians and cyclists but restricts motor vehicle access. Posts should be at least three feet high and use reflectors to make them visible at night.

The center barrier post can be a drop-down bollard or a removable post that will allow entrance by authorized emergency and maintenance vehicles. In addition, it is recommended that four inch yellow pavement striping in an envelope around the posts be provided to ensure that their location is well marked and visible to cyclists, day or night.

An alternative design presented by the AASHTO is to split the entryway into two five-foot paths separated by low landscaping to restrict entry of motor vehicles. This design is the preferred treatment in high-volume areas where heavy trail use may limit a cyclist’s view of the center bollard.



## *Multi-Use Trail Highway Underpass Tunnel*



In instances where existing trail and trail path widths and locations are not consistent with the standards located in the Trails Element, transition from the existing width and locations to those required herein are to be made at street intersections or at other places where there is an interruption in the trail continuity or to be made gradually such that the trail meanders.

## **ON-STREET BICYCLE TRAILS**

On-street bicycle trails, also referred to in the vernacular as bicycle routes, are designed, constructed, and retrofitted roadways for bicycle travel. Since in many cases the streets need to be altered to accommodate on-street trails, the last part of this section presents retrofit guidelines. There are basically three types of on-street bicycle trails: (1) shared roadways, (2) paved shoulders, and (3) bicycle lanes. Each is discussed below.

### **SHARED ROADWAYS**

Shared roadways include all streets and highways with no pavement markings for bicycle travel, typically featuring 14-foot wide curb lanes with or without shoulders. Such routes should not be located on streets with less than 14-foot wide curb lanes, except on local streets in residential areas with low motor vehicle traffic volumes and speeds.

Wide curb lanes are more appropriate for experienced cyclists on high-speed rural highways and high-volume urban arterials where there is insufficient room for a separate bike lane. They also are appropriate where there are frequent intersecting commercial driveways or cross streets that complicate bicycle lane treatment.

Wide curb lanes have the particular advantage of providing additional operating room for both bicycles and motor vehicles on arterial streets, of maintaining motor vehicle capacity of a curb lane when it is also used by cyclists, and in allowing motor vehicles to pass bicycles without having to change lanes. They minimize both real and perceived operating conflicts between bicycles and motor vehicles by forcing recognition and awareness on the part of motorists, particularly at intersections. Wide parking/turning/curb marked lanes can be confusing to motorists and bicyclists.

Streets with general shared lane conditions can be improved for bicycle travel by (1) removing all hazards to bicycle travel, especially if they are to be designated as part of a bicycle route system and (2) using traffic calming methods to control traffic and reduce speeds. Each is discussed as follows.

## HAZARDS REMOVAL

Hazards that should be eliminated in shared roadways include improper drainage grates, dangerous railroad crossings, unresponsive traffic signals, improvements in transition areas, and enhanced maintenance practices which are discussed below. For the most part, the removal of hazards is inexpensive and can be accomplished within routine maintenance and improvement schedules and budgets.

Hazard removal and roadway maintenance practices are addressed in the AASHTO *Guide for the Development of Bicycle Facilities*. The following supplemental guidance is offered in eliminating the most common bicycle hazards.

### Drainage Grates

Drainage grate inlets may pose potential problems to cyclists. Most states have eliminated use of the parallel bar drainage grate and instead substitute bicycle friendly and hydraulically efficient inlets.

In new construction, curb inlets are preferred to grate inlets whenever possible. When grate inlets are installed, they should not be of the parallel-bar design.

A program for identifying and replacing existing parallel-bar grates should be implemented as a high priority action item. At a minimum, the temporary correction recommended by AASHTO should be undertaken in popular bicycling corridors. This interim solution involves welding steel cross straps perpendicular to the parallel bars to provide a maximum safe opening between the straps, or retrofitting the grates with pre-fabricated cross bars.

### Railroad Crossings

When bikeways cross railroad tracks at grade, the crossing should ideally be at a right angle to the rails. When this is not possible, the approach, roadway, shoulder, or bicycle lane should be widened by six to eight feet, depending on the amount of available right-of-way. This will allow bicycles to cross railroad tracks at a right angle without veering into the path of oncoming traffic.

Filling the flange way of the outside travel lane with a rubberized material is another solution to improve crossings of low-speed rail lines. This treatment typically involves extensive construction work to replace a timber or asphalt crossing with a concrete slab, rubberized crossing, and flange way filler strip, but it should decrease long-term maintenance costs and greatly improve cyclist safety.



*Trail crossings of streets should occur at controlled intersections*

## **Traffic Control Devices**

AASHTO discusses clearance intervals for traffic signal timing and recommends that traffic-actuated signals be sensitive to bicycles. There are several loop designs that can accommodate bicycles in various roadway applications.

Alternatives to pavement loops include use of video cameras to detect bicycle and other traffic and use of microwave sensors. Video systems use cameras mounted on signal arms and “virtual loops” drawn on a computer screen. The computer system is capable of sensing up to 60 different detection zones within a single intersection for a cost comparable to loop detectors buried within the pavement. Microwave systems are more expensive than standard loops but are highly reliable for remote traffic sensing and bicycle detection.

Fine-tuning existing traffic detection systems may also improve bicycling conditions. Signal timing should include a minimum green time that allows cyclists to remount their bicycles and travel across the intersection and a yellow/red time that provides a safe bicycle clearance interval. Generally, two to three seconds added to the minimum automobile green time is appropriate. A yellow interval of three seconds offers sufficient time for a cyclist to come to a complete stop or enter the intersection legally and an all-red clearance interval greater than two seconds is needed to clear bicycles from most intersections.

## **Transition Areas**

Abrupt changes in the pavement width of the right travel lane or shoulder should be avoided. While skilled cyclists will ride in a straight line by guiding off the lane stripe, many riders will unpredictably move right or left as the lane or shoulder widens and narrows.

Special transition problems frequently occur where new and undeveloped properties are located side by side, because new developments are required to provide the full width of paving across the property. Such problems also occur at bridges and other structures, either when traffic lanes merge to cross a narrow bridge or when a narrow roadway approaches a new, wider bridge. In either case, warning may be provided to both cyclists and motorists by using appropriate signage in advance of any transition in pavement width where roadway clearance is less than the width of the approach pavement.

An additional treatment for unavoidable obstacles, such as narrow bridges, is to use zebra warning striping on the bridge shoulders. The pavement striping shifts motor vehicle traffic away from the bridge parapet and provides additional operating space on the right-hand side of the bridge for bicycles.

For the second situation, safe bicycle passage may be accommodated in the transition from a wide structure to a narrow roadway by continuing the extra operating width of the bridge shoulders or wide outside lanes for at least 100 feet on either side of the bridge. If on- or off-ramps or intersections are present, the shoulder or wide curb lane treatment should continue at least as far as the ramps or intersection.

### **Rumble Strips**

Rumble Strips are grooves often placed at the edges of roadways, primarily along state highways, to alert drivers that may inadvertently veer toward the pavement's edge. According to state's standards, the rumble strips are inset from the edge of the pavement and located within bicycle lanes, leaving only from one to two feet of paved surface for bicycle travel. Such rumble strips are not conducive to bicycle travel; therefore, where bicycle routes are anticipated, the rumble strips should be inset or the pavement shoulder widened to provide an unimpeded four foot bicycle travel lane.

### **Improved Maintenance**

Additional hazards to bicycle travel may include gaps in longitudinal paving joints, potholes, bumps, and other pavement surface irregularities that can be eliminated through low-cost maintenance repairs. Routine maintenance practices, or lack thereof, may also increase cyclist sensitivity to gravel, sand, glass, and other roadway debris.

## **TRAFFIC CALMING/DIVERSION/SPEED REDUCTION MEASURES**

A wide range of measures is available for controlling traffic movements and reducing motor vehicle speeds on local streets while providing safer and more pleasant conditions for pedestrians and cyclists. "Traffic calming" is a term that has emerged to describe these measures. The idea of limiting automobile speeds and access, however, is not new. Traffic diverters and cul-de-sacs were first introduced in the 1940s. The objectives of traffic calming include:

- Promoting safe and pleasant conditions for motorists, cyclists, pedestrians, and residents on neighborhood streets.
- Mitigating the impacts of vehicular traffic, including air pollution, accidents, and noise.
- Offering more equitable status to all road users.
- Increasing landscaping opportunities and play space on public rights of way.

In addition to traffic calming techniques, many of which are used to retrofit existing streets, some current trends in new development are questioning roadway standards and layout generally used for new subdivisions. “Neotraditional” town planning encourages a return to grid street patterns, on-street parking, narrower streets, smaller turning radii, and the use of alleys rather than driveways. The grid allows for a greater degree of choice of route to any given destination, while fewer driveways reduce the exposure of cyclists to intersecting traffic. While narrower streets alone might actually decrease the safety of cyclists, the neotraditional approach sometimes incorporates additional traffic calming measures to ensure that the design of streets ultimately results in slower speeds for automobiles.

The following are some common types of traffic calming techniques that are used.

### **Speed Humps**

Raised humps are sometimes installed in local roadways, driveways, and parking lots to slow traffic. Speed humps should not be fully extended to allow for the passage of cyclists.

Speed humps slow traffic on residential streets, in parking lots, on driveways, and at other approaches to areas of intensified interaction of motor vehicles, pedestrians, and cyclists, such as schools. They are very effective in discouraging the use of residential streets as cut through routes.

Speed humps should be designed with the needs of cyclists in mind. Very sudden humps without well-defined gaps in them for use by cyclists can cause unintended discomfort and danger to cyclists. They also are most effective when spaced not more than 500 feet apart.

### **Traffic Circles**

Traffic circles, as used for traffic calming purposes, are small, round islands centered in an intersection, around which traffic must travel. The traffic circle presents a physical obstacle that slows traffic and also serves to warn cyclists and motorists about the upcoming intersection. They slow traffic at intersections on local streets without the need for stop or yield signs.

Traffic circles should be sufficiently visible to deter over-running by motor vehicles. Each circle should also be fitted to the intersection geometry and have a two-foot concrete apron around the edge for emergency vehicles or large trucks, if necessary.

Traffic circles must be designed with center islands sufficient in size to actually slow traffic. If not, traffic is diverted but not slowed and hazards can be increased rather than decreased for pedestrians and cyclists.



## **Chicane**

Chicanes are partial barriers or parking bays staggered on alternate sides of the street around which drivers must maneuver. A good example of where they have been installed is along 4th Street south of Downtown. They create narrower and curved travel surfaces from what was previously a straight roadway. They are useful as a means of slowing traffic and creating either landscaped areas or diagonal parking bays.

As with traffic circles, chicanes can increase rather than decrease traffic hazards for pedestrians and bicyclists if they are not substantial enough to decrease motor vehicle speeds.



## **Partial or Total Traffic Diverters and Cul-de-Sacs**

Traffic diverters wholly or partly close roadways or change the directional options for motor vehicles. Cul-de-sacs close a road at one end. Because they prevent through traffic, local traffic volumes are reduced. By designing gaps in diverters and at the ends of cul-de-sacs, bicycle traffic is exempted from the restrictions imposed on motor vehicles. Partial diverters allow access and egress for cyclists in both directions while blocking entry to motor vehicles at one end.



Access for cyclists should be signed to warn motorists of such constraints.

## **Curb Extensions/Curb Radius Reductions**

Curb radii have been increased over the years to accommodate longer truck and bus lengths and to increase capacity by facilitating right-turn movements. These larger radii increase dangers to crossing pedestrians and to crossing and right-turning cyclists because of the faster motor vehicle movements and because the intersection is widened and exposure to traffic is increased. The reduction of curb radii and curb extensions effectively narrow the intersections. Extensions usually take the form of a bulb extending from the corner into the travel way of one or both of the intersecting roads.

Decreased curb radii might be inappropriate for streets that accommodate bus service. Large truck access might have to be restricted or regulated in those areas where curb radii are decreased. Installation of curb bulbs limits the use of the curb lane to parking. This might be a disadvantage to cyclists, as the extra road space might otherwise better accommodate shared use or a bike lane.

*Properly designed traffic calming measures as well as bike lane designations can reduce the hazards for all commuters*

## **PAVED SHOULDERS**

The concept of bicycle-compatible roadways combines hazard removal with additional operating space to improve streets for shared use by cyclists and motor vehicles. As another type of on-street trail, paved shoulders are paved and maintained roadway shoulders that improve conditions for

bicycle travel on roads without curb and gutter. Consequently, this type of treatment for bicycle routes is particularly useful in rural and newly developing areas and on high-speed, rural arterials when wide curb lanes are not practical.

In designing and constructing paved shoulders, the shoulders must be paved and maintained to an equivalent surface standard as regular travel lanes. They should continue through intersections and not be routinely used as right-turn lanes for vehicular traffic. Rumble strips should not be used on shoulders designated for bicycle travel. If they are used, additional paved width for cyclists should be provided on the right side of the rumble strip. The shoulders may be designated as lanes for preferential bicycle use through appropriate signage and pavement markings if they meet the recommended AASHTO width of four feet or greater.

## **BICYCLE LANES**

One of the goals of a truly multimodal transportation plan is to encourage more people to ride bicycles for short-distance personal, business, and social trips. To realize this increase in use, it may be desirable to provide facilities that act as a “host” to bicycling activities. Bike lanes, as well as bike paths which were discussed earlier in this chapter, are recommended for this purpose.

The impact of host facilities is particularly important for casual or inexperienced cyclists not adept at riding in traffic. On-street bicycle lanes offer a designated and visible space for cyclists and can be a significant factor in route choice

Bicycle lanes are very desirable in improving conditions for cyclists of all abilities within a given corridor, encouraging increased bicycle use on a given roadway by providing a greater degree of comfort and perceived safety for less-skilled cyclists, providing more predictable movements by cyclists and motorists, establishing an overall channeling effect, and promoting an orderly flow of traffic.

Their location is appropriate where significant bicycle demand is desired or expected on arterial streets and roadways, generally defined as having average daily traffic flows that exceed 10,000 or average motor vehicle speeds that exceed 30 mph. They are also appropriate on streets where lane designation is not complicated by frequent roadway intersections and commercial driveways; on streets with heavy bicycle traffic where cyclists must frequently pass each other traveling in the same direction; when it is desirable to delineate the right-of-way assigned to cyclists and motorists to provide for more predictable movements by each; and when the route is anticipated to serve less experienced adults and children.

Bicycle lane markings can mistakenly increase a cyclist's confidence that motorists will not stray into his or her path of travel. The lanes must, therefore, be clearly marked. The lanes should be designated for one-way travel with facilities provided on both sides of a roadway. Special consideration must be given to the treatment of bicycle lanes on roadways with on street parking and to the treatment of bicycle lanes at major intersections.

## **RETROFIT GUIDELINES**

Because the residents, densities, and land uses that support bicycling are often found in built-up areas, retrofitting existing streets and roadways is viewed as a necessity to better accommodate bicyclists. The following guidelines determine which portions of a roadway may be modified (and by how much) to be consistent within AASHTO minimums and to accommodate on-street bicycle lanes. These modifications can often be made without significantly affecting the safety or operation of a roadway and are addressed below.

### **Reconsider the Need for Parking**

A roadway's primary function is to move people and goods, not to store stationary vehicles. In some cases, parking may only be needed on one side to accommodate residences and/or businesses. Parking can sometimes be narrowed to seven feet adjacent to a bicycle lane, particularly in areas with low truck-parking volumes.

### **Traffic Speed and Lane Widths**

In speed zones of 40 mph or greater, 12-foot travel lanes and a minimum 14-foot center turn lane should be maintained where there are high truck volumes. In speed zones of 35 mph or less, however, inner 11-foot travel lanes (if two or more lanes in each direction) and/or 12-foot center turn lanes may be provided. These narrower lane widths will provide more shared space for bicycle travel in outer travel lanes.

### **Number of Lanes and Lane Widths**

In situations where there are four lanes of traffic (two in each direction) and a significant number of left-turn movements, re-striping for a continuous left-turn lane, two travel lanes, and two bike lanes should be considered.

### **Removal of Obstructions**

Some older paved or landscaped traffic islands reduce roadway width unnecessarily. If they are not needed for access control, removal and replacement of raised medians or islands with pavement markings can often add several feet of usable width, as can relocation of utility poles, guardrails, and other obstructions away from the edge of the roadway.



*Clearly marking bike lanes enhances the potential for use as well as safety*



Generally, the safety of motorists and cyclists is not compromised with the modifications listed above, as the total pavement width is the same or wider. In many cases, safety is enhanced because motor vehicle lanes are further away from curbs, all travel lanes are better defined, and parking is removed. Adding bike lanes can improve sight distances and increase turning radii at intersections and driveways.

Not all existing roadway conditions will be as simple to retrofit as those listed above. In many instances unique and creative solutions will have to be found.

It is also important that every effort be made to ensure bikeway continuity. Practices such as directing cyclists onto sidewalks should be avoided, as they may introduce unsafe conditions.

## **TRAILS SYSTEM ALIGNMENTS**

### **LOCATION CRITERIA**

The previous chapter presented standards for various types or classifications of trails based on those standards recommended by such nationally renowned groups as the American Association of State Highway and Transportation Officials (AASHTO) and other trails organizations. This chapter addresses the location criteria for the trails system alignments and includes maps illustrating their proposed location.

Trails are located or aligned to form a transportation system for pedestrian and non-motorized vehicular travel with linearity, continuity and accessibility being the principal factors involved. Accordingly, general rules applicable to streets and highways are also applicable to trails. The street system for the city is composed of local streets, collector streets and arterial streets. Local streets provide access to individual parcels and collector streets “collect” or bring together the traffic from local streets to arterial streets that are designed to carry the traffic from one area of the community to another. In the same manner, sidewalks located adjacent to individual parcels provide access to multi-use trails that interconnect various parts of the community.

Sidewalks function adequately for low volumes of pedestrian travel. Similarly, shared roadways on local streets are sufficient for experienced bicyclists and those persons who are familiar with the rules and regulations applicable to motorized vehicle travel. Shared roadways and bicycle lanes on collector and arterial streets are the preferred routes for experienced bicyclists.

Where high volumes of travel are expected, where on-street bicycle routes are unsafe, or bicyclists are inexperienced and not familiar with the rules and regulations applicable to motorized vehicle travel, off-street, multi-use trails should be provided. This plan establishes as an objective, that multi-use trails be located so the distance to a trail does not exceed one mile. However, the spacing of multi-use trails depends more on existing and anticipated traffic volumes and traffic generation. In and near the downtown, for example, more multi-use trails should be anticipated where a higher volume of pedestrian and bicycle travel is expected.

It also is important that multi-use trails interconnect with areas that generate high traffic volumes. Consequently, where there are regional and community libraries, schools, colleges, parks and other recreational facilities and employment centers, multi-use trails should be provided.

Multi-use trails should be located where there is continuity for bicyclists and other users for a considerable distance. Accordingly, they should be located where uninterrupted corridors are available to provide long, continuous routes for commuting, or journeying to school; within an independent right-of-way; as cut-throughs between buildings or connections between cul-de-sacs and breaks in the street network; where there is sufficient space or a physical divider; and where few streets and driveways intersect with the facility.

Trail crossings of streets should occur at controlled intersections. Mid-block crossings should be avoided wherever possible, especially in high traffic corridors, as crossing a street in traffic can be very dangerous. Where such crossings do occur, a surface level center median and a traffic control signal should be provided.

Potential good locations for multi-use trails are identified along major power utility corridors and linear parks or greenways. Such corridors usually include ample right-of-way for the installation of trail paths in conjunction with perimeter landscaping and other amenities.

Major power utility corridors are established within utility easements from 40 to 150 feet in width. Many have 100-foot widths, but the Nevada Power Company prefers to have easements with no more than 40 to 45 feet of width. When located along streets, half of this width is located within street rights-of-way.

The utility easements are established between the Nevada Power Company and property owners, and no permanent structure may be located within them that would infringe upon the Company's right to access utility structures for repair and maintenance. An example of a trail in such a linear corridor exists in the vicinity of Gowan Road and Cimarron Road and exemplifies the manner in which they should be provided.



*Utility easements should accommodate utility structures but not obstruct the corridor*

Multi-use trails may also be located in or next to arroyos or to drainage channels with the approval of the Clark County Regional Flood Control District ("District"). Most drainage channels are dedicated as rights-of-way or drainage easements and are under the control of the City of Las Vegas. These facilities are considered either regional or local facilities with the distinction that all regional facilities are designed to convey a 100-year frequency flood and local facilities usually a 10-year flow. Many of the drainage channels are located underground within street rights-of-way, but some are designed as open channels at grade that may be either unlined earthen channels or lined with riprap, concrete, or other material to prevent them from eroding. The Las Vegas Wash, which extends from North Las Vegas to Henderson through the southeast corner of Las Vegas, is a major drainage channel over 100 feet wide that is both unlined and lined in places but is predominately an open unprotected channel. The Las Vegas Wash follows an historical flow path and is maintained by the City.

Wherever channels are located at grade and maintained by the City, they must be concrete lined according to the standards of the Clark County Regional Flood Control District ("District"). The City's current policy is to enclose all drainage channels underground within street rights-of-way where possible. The surface over enclosed channels is a good location for multi-use trails, provided streets do not conflict with the trails.

With few exceptions, open drainage channels are entirely fenced off to prevent persons from entering them and to avoid problems of safety, vandalism, and major crimes. The channels' steep side slopes are lined with concrete; consequently, the City is very concerned with persons' access to them and getting injured from falling or drowning. Drainage channels fill very rapidly during rainstorms, and flows of 6,000 cubic feet per second with velocities of 30 to 40 feet per second are common, making them difficult to get out of during a storm event. The City is also concerned that an intruder could gain access to them and cause vandalism or scale perimeter walls into private residents' properties to commit a crime.

The District's design standards also require that a 12-foot access road be provided along all open drainage channels for access to and maintenance of the channels. Accordingly, all drives are to be located within fenced enclosures that prevent access to the channels by the public. Some desire has been expressed to open the fenced enclosures to use the drives as multi-use trails. However, removing these enclosures may then result in the problems mentioned above. Moving the fence to a location between the access road and the channel will inhibit access to the channel by maintenance crews and rescue workers during floods. A possible solution to this dilemma is the installation of a short fence located five feet away from the channel with gated openings along the fence.

Interest has also been expressed in improving the open drainage channels as landscaped greenways within which multi-use trails could be located. The Pueblo Greenway in Summerlin is a good example. This greenway has a trail that connects three small neighborhood parks. The cities of Phoenix and Scottsdale in Arizona are well known for having similar landscaped greenways.

Greenways are very expensive to maintain, particularly following storm events, and with the Valley's steeper terrain, in comparison to the cities of Phoenix and Scottsdale, erosion protection of the channels is necessary. Although the City presently maintains the Pueblo Greenway, it is not protected nor part of the regional drainage system. If it were, it would be enclosed and placed underground in the City's system.

Since open drainage facilities are regional in extent, their use for multi-use trails should be evaluated on a regional basis. The Alternative Mode Transportation Master Plan under preparation by the Regional Transportation Commission will address these facilities. Consequently, except for the Las Vegas Wash, the Trails Element does not portray the alignment of multi-use trails along drainage ways, pending results of the study. The Las Vegas Wash is proposed for use of a multi-use trail and pre-engineering plans are being prepared for its eventual use.

While greenways can be attractive landscaped features, their use for a trail system must also be evaluated in comparison to the expense, safety and other problems. The City should encourage greenways with multi-use trails in master planned communities and in other locations where there are well-established homeowners associations to maintain them and where safety problems can be minimized.

## TRAIL ALIGNMENTS

Based on the objectives and criteria and the trail classifications and standards of the previous chapters, trails plan maps of trail alignments have been formulated. Map #2, Off-Street Multi-Use Transportation Trail Alignments, shows the locations of multi-use transportation trails. This map replaces Map #1 Centennial Hills Sector Map – Existing and Proposed Trail Alignments (also referenced as Map #1 in the Centennial Hills Sector Plan). Map #3, On-Street Bicycle Trail Alignments, shows the location of on-street bike trails, including bicycle routes and bicycle lanes. It should be noted that all streets are available for bicycle travel, but only those that meet the objectives of the Trails Element are shown on the map.

Where a direction for a multi-use trail is designated, the trail is to be provided along that direction of the street or trail corridor. Where no direction is noted, the appropriate side of the street or trail corridor shall be determined at the initial opportunity for development of the trail section. Where different types of trail paths or sidewalks overlap on one or both sides of a street, the widest unencumbered trail path or sidewalk is to be provided.



*Greenways with multi-use trails should be encouraged in locations where well-established homeowners associations exist*

## **SUMMERLIN TRAILS**

Map #4, Summerlin Multi-Use Trail Alignments, illustrates the location of existing and proposed multi-use trail alignments for Summerlin and Map #5, Summerlin Bike Trail Alignments, shows the location of bicycle routes and bicycle lanes in Summerlin. The trails proposed in Summerlin will be developed and maintained by The Howard Hughes Corporation and are not the responsibility of the City.

## **TOWN CENTER TRAILS**

Map #6 shows the multi-use, off-street trails proposed in Town Center at U.S. 95 and the Beltway. The widths noted are the actual widths of the trail paths to be constructed on both sides of the streets; most will have amenities such as trees and street furniture located within the trails. Map #7 shows the on-street trails in Town Center. All trails, except for the multi-use trails, are incorporated in the Town Center Development Standards as sidewalks and amenity zones.

## **LONE MOUNTAIN TRAILS**

The Lone Mountain Trails are located along both sides of the Beltway, north of Cheyenne Avenue. The trails, as illustrated on Map #8, are part of the "Lone Mountain Master Development Plan" adopted on February 5, 1997 and the "Lone Mountain West Master Development Plan and Design Standards" on June 14, 1999.

## **TRAILHEADS**

### **FACILITIES AND LOCATION**

Areas that serve as beginning or stop-off points for trails should be provided where necessary to serve trail users. They should include, at a minimum, parking, trail information, rubbish containers and water and sanitary facilities. Since multi-use trails provide linkages to community and regional parks, parks that link to the trails should be designed to provide locations for trailheads as well. Water and sanitary facilities, parking, and other park amenities are necessary for general parks purposes and provide the necessary amenities required for trail users.



Map No. 2

*City of Las Vegas*

# OFF-STREET MULTI-USE TRANSPORTATION TRAIL ALIGNMENTS

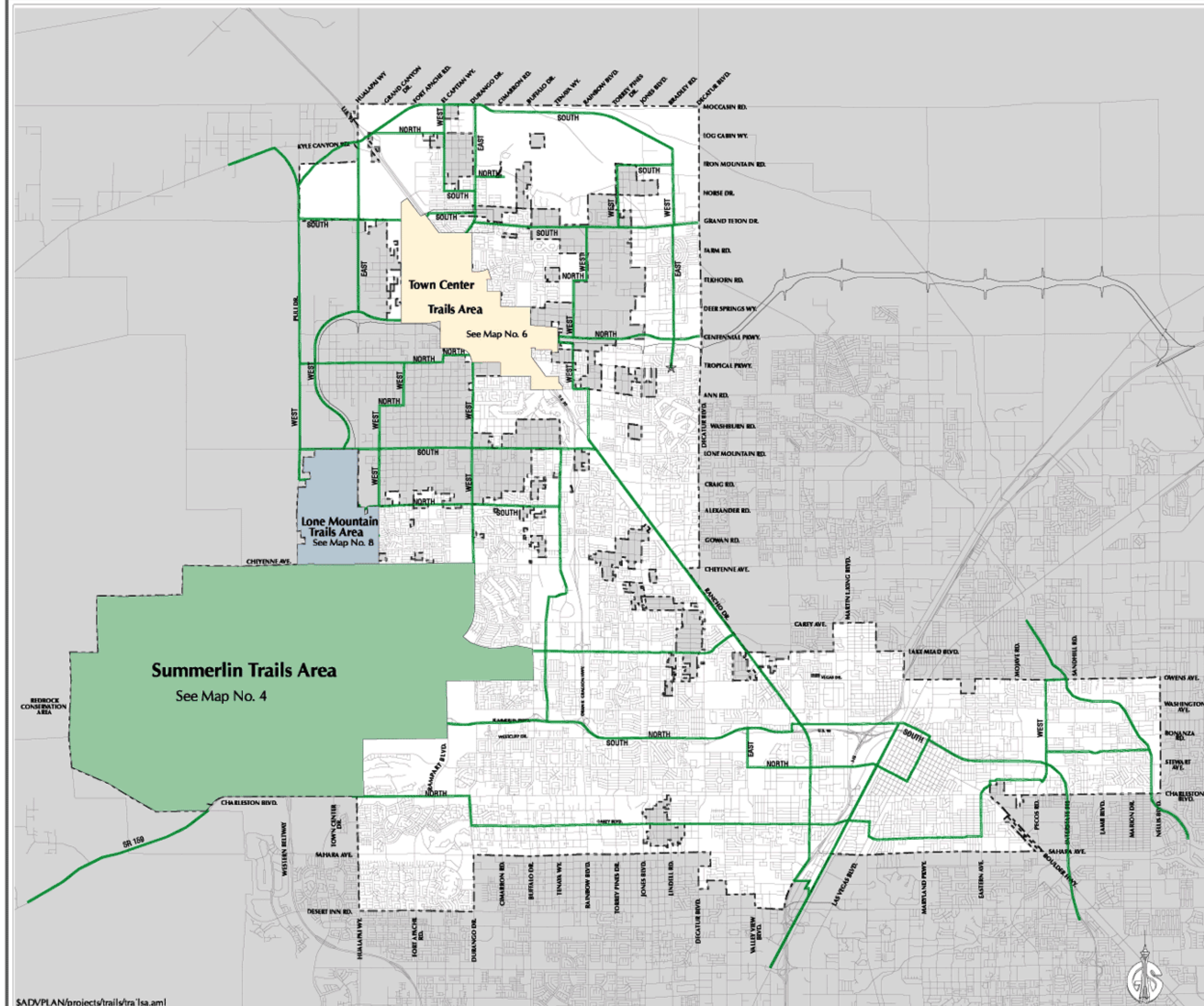
-  Multi-Use Trail
-  Sidewalk Connection

Adopted: January 16, 2002  
Ordinance No. 5417

This map replaces Map No. 7 of the Centennial Hills Sector Plan.

PLANNING &  
DEVELOPMENT  
  
Development  
Services Center

Plotted: January 22, 2002  
GIS maps are normally produced  
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**Map No. 3**

City of Las Vegas

## ON-STREET BICYCLE TRAIL ALIGNMENTS

 Bike Lane  
 Bike Route

Adopted: January 16, 2002  
Ordinance No. 5417

Plotted: January 22, 2002

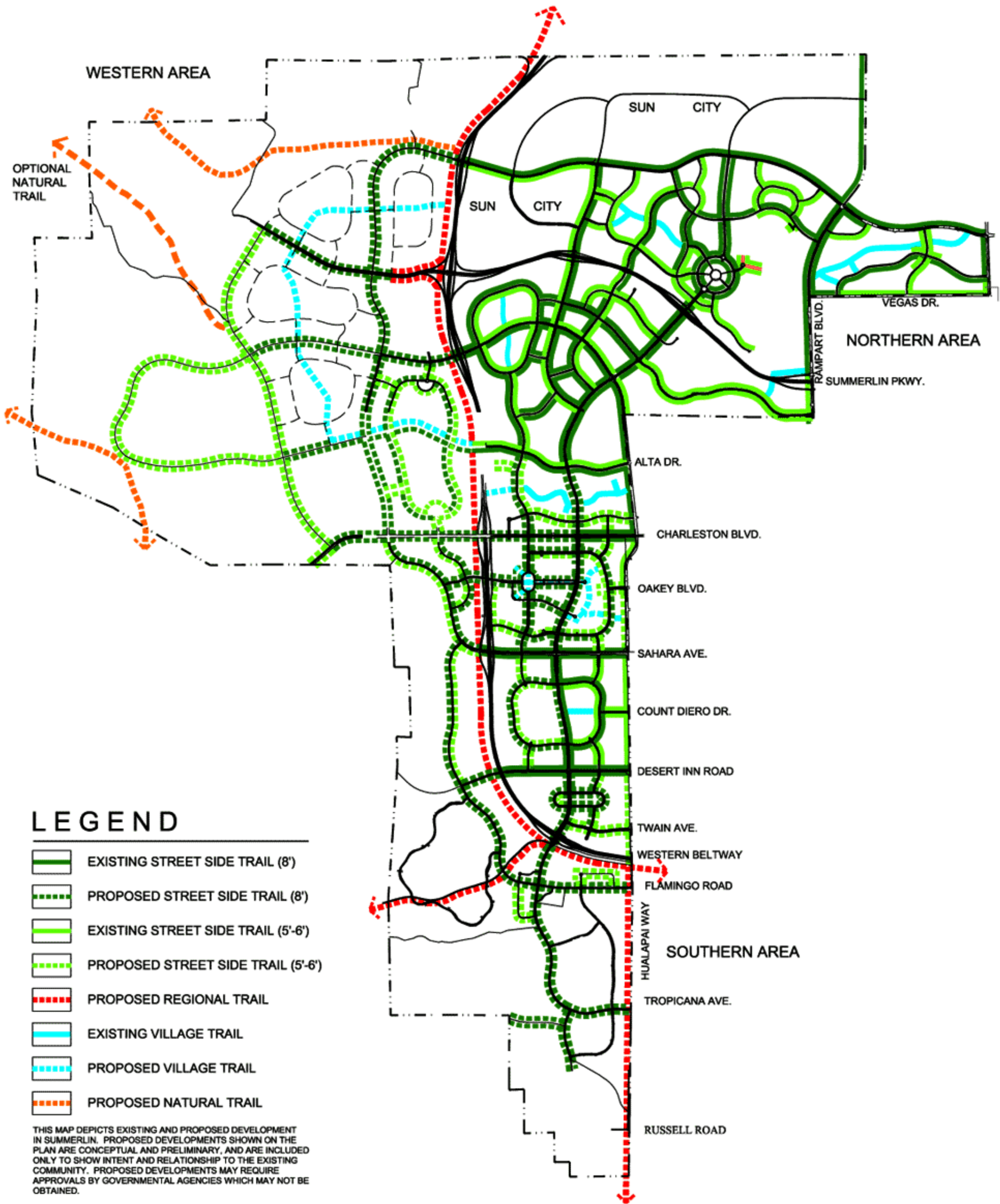
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**Geographic Information System**

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## LEGEND

- EXISTING STREET SIDE TRAIL (8')
- PROPOSED STREET SIDE TRAIL (8')
- EXISTING STREET SIDE TRAIL (5'-6')
- PROPOSED STREET SIDE TRAIL (5'-6')
- PROPOSED REGIONAL TRAIL
- EXISTING VILLAGE TRAIL
- PROPOSED VILLAGE TRAIL
- PROPOSED NATURAL TRAIL

THIS MAP DEPICTS EXISTING AND PROPOSED DEVELOPMENT IN SUMMERLIN. PROPOSED DEVELOPMENTS SHOWN ON THE PLAN ARE CONCEPTUAL AND PRELIMINARY, AND ARE INCLUDED ONLY TO SHOW INTENT AND RELATIONSHIP TO THE EXISTING COMMUNITY. PROPOSED DEVELOPMENTS MAY REQUIRE APPROVALS BY GOVERNMENTAL AGENCIES WHICH MAY NOT BE OBTAINED.

ALL PROPOSED LAND USES AND IMPROVEMENTS ARE SUBJECT TO MODIFICATION OR ELIMINATION WITHOUT NOTICE. THE INFORMATION DEPICTED HERE SHOULD NOT BE A BASIS FOR A DECISION TO PURCHASE OR LEASE PROPERTY IN SUMMERLIN.



## MULTI-USE TRAIL ALIGNMENTS MAP No. 4

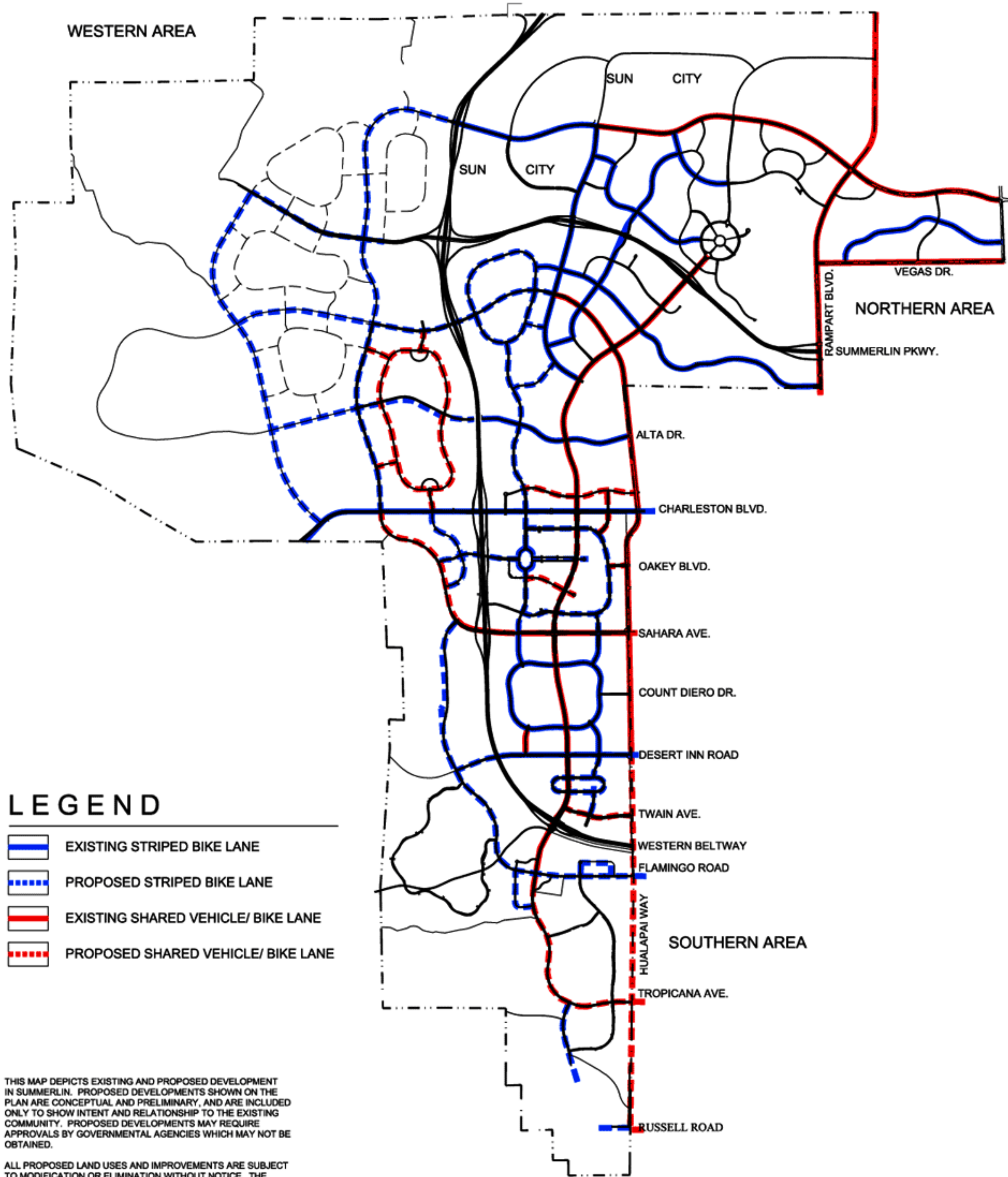
Prepared for

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An Affiliate of THE ROUSE COMPANY

EDAW File: P:\1997\7N17601\CAD\Community-Wide\MP-trail.dwg





## LEGEND

-  EXISTING STRIPED BIKE LANE
-  PROPOSED STRIPED BIKE LANE
-  EXISTING SHARED VEHICLE/ BIKE LANE
-  PROPOSED SHARED VEHICLE/ BIKE LANE

THIS MAP DEPICTS EXISTING AND PROPOSED DEVELOPMENT IN SUMMERLIN. PROPOSED DEVELOPMENTS SHOWN ON THE PLAN ARE CONCEPTUAL AND PRELIMINARY, AND ARE INCLUDED ONLY TO SHOW INTENT AND RELATIONSHIP TO THE EXISTING COMMUNITY. PROPOSED DEVELOPMENTS MAY REQUIRE APPROVALS BY GOVERNMENTAL AGENCIES WHICH MAY NOT BE OBTAINED.

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# ON STREET BICYCLE TRAIL ALIGNMENTS MAP No. 5



Map No. 6

*City of Las Vegas*

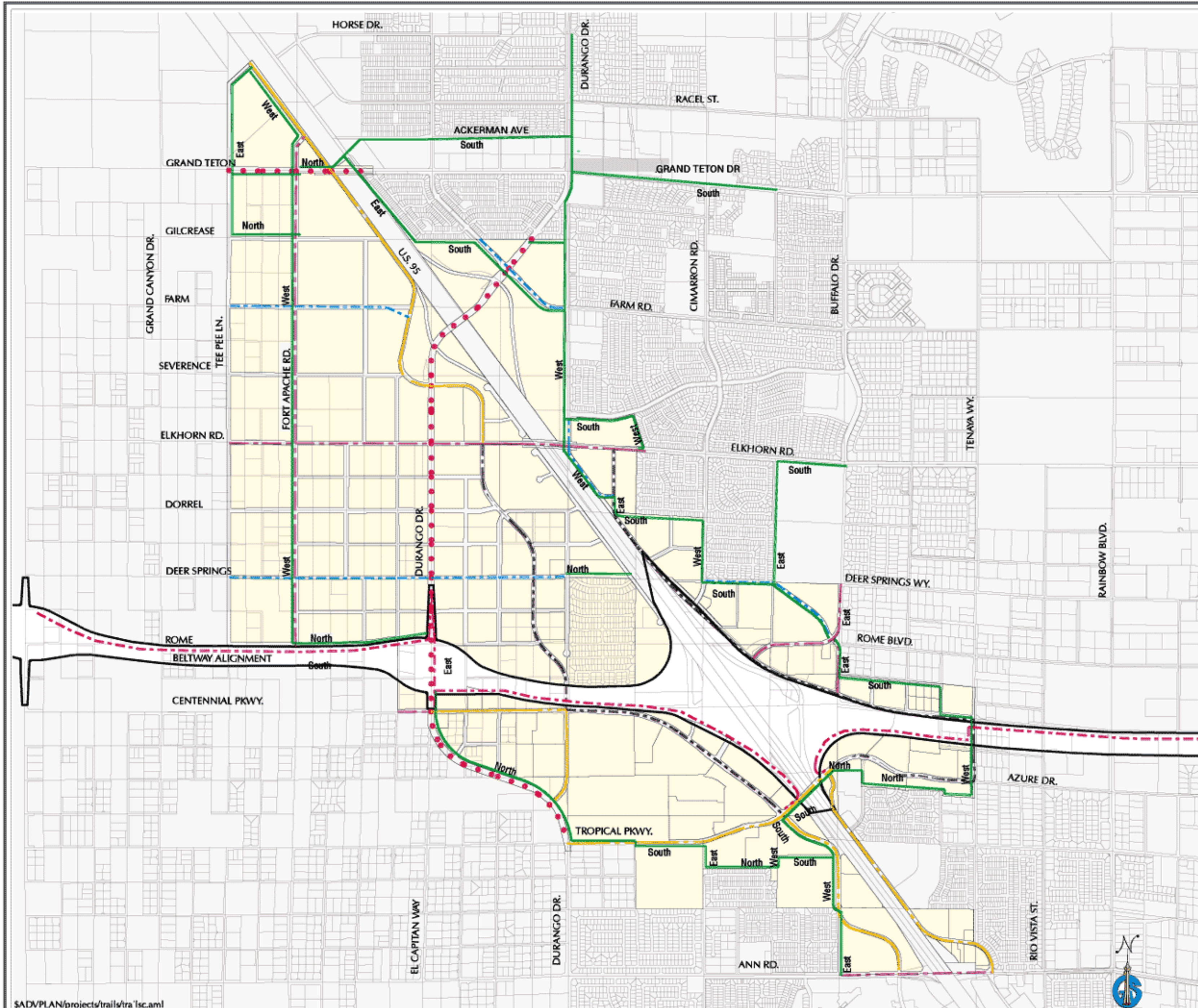
# TOWN CENTER MULTI-USE TRAIL ALIGNMENTS

-  Town Center Parkway Trail (14'6")
-  Primary Arterial Trail (7'6")
-  Town Center Loop Trail (9')
-  Town Center Arterial Trail (8')
-  Town Center Collector Trail (12')
-  Frontage Road Trail (9')
-  Beltway Trail
-  Multi-Use Trail
-  Town Center

Adopted: January 16, 2002  
Ordinance No. 5417

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




Map No. 7

*City of Las Vegas*

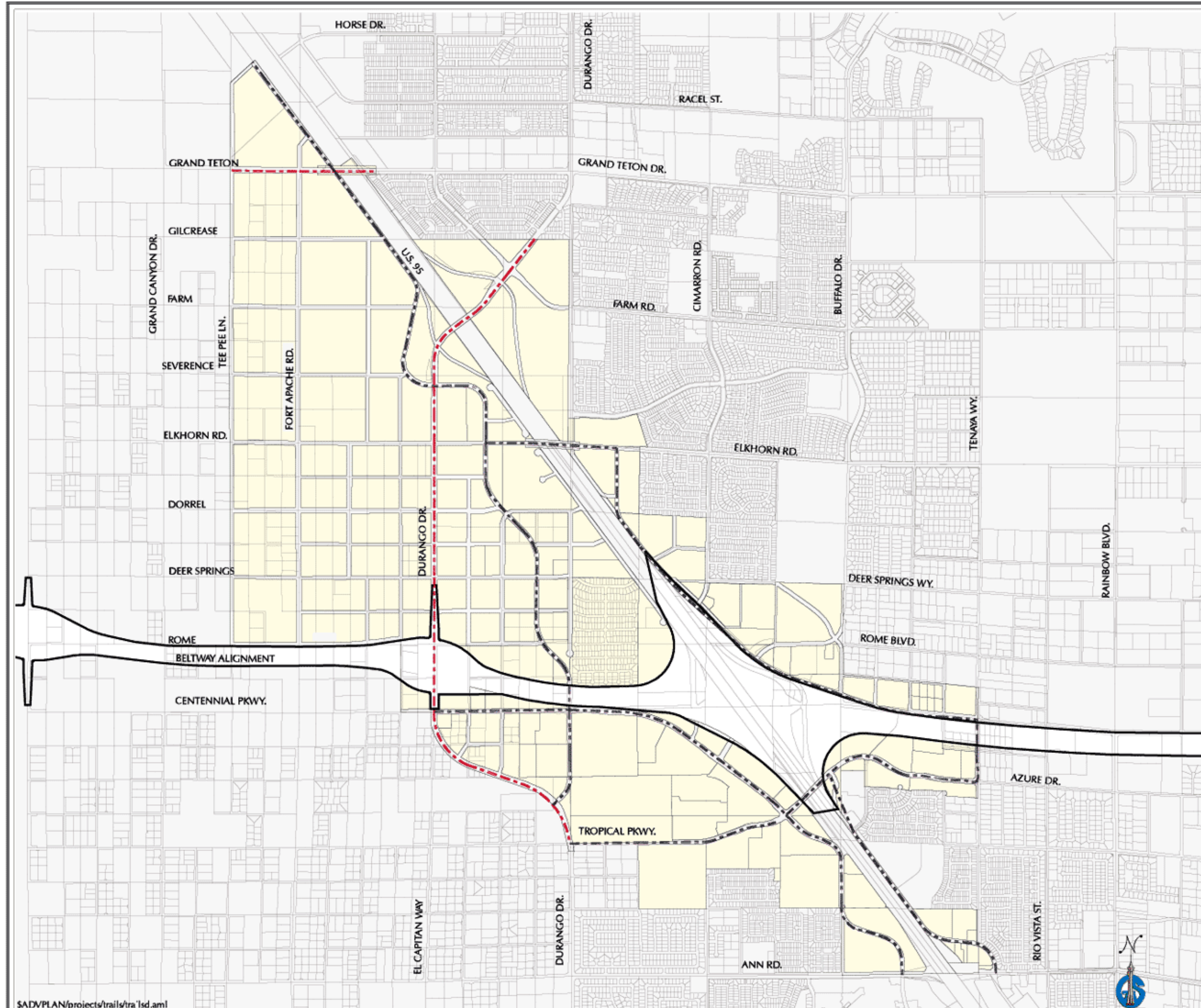
## TOWN CENTER ON-STREET BICYCLE TRAIL ALIGNMENTS

-  Bike Routes
-  Bike Lanes
-  Town Center

Adopted: January 16, 2002  
Ordinance No. 5417

Plotted: January 22, 2002  
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Map No. 8

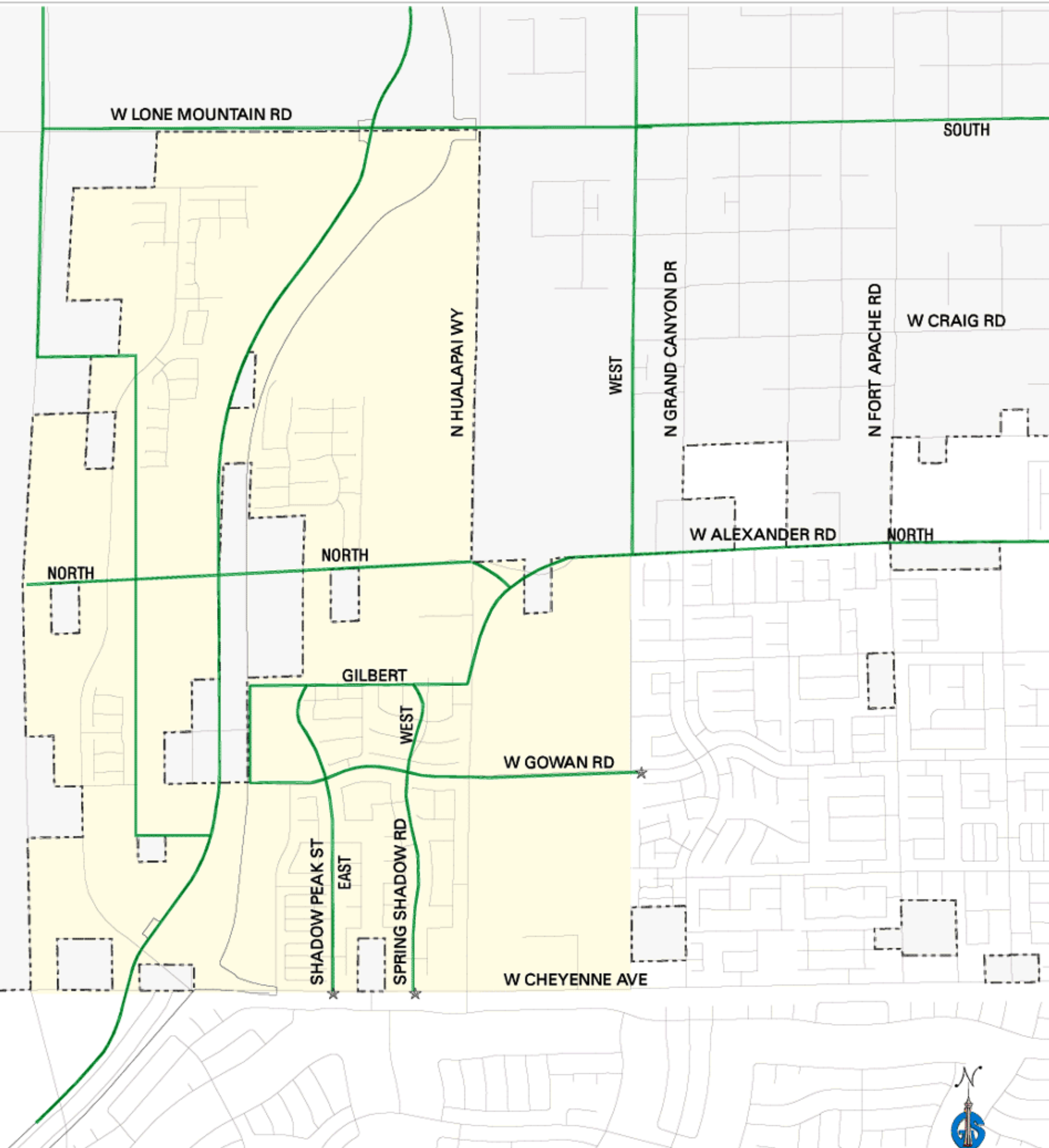
*City of Las Vegas*

# LONE MOUNTAIN MULTI-USE TRAIL ALIGNMENTS

-  Multi-Use Trail
-  Lone Mountain Area
-  Sidewalk Connection

Adopted: January 16, 2002  
Ordinance No. 5417

Plotted: January 22, 2002  
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## IDENTIFYING TRAILS

Identifying trails provides directional assistance to trail users and indicates to users the differences among alternative routes. Designated routes may vary in facility types: paved shoulders, bicycle lanes, multi-use trails, and general shared roadway conditions that have compatible motor vehicle volumes and speeds. To provide directional information, a standard trail sign should be supplemented with arrow plates, names of routes, distances to destinations, etc.

A bike route, through appropriate signing, may encompass any of the facility types or general roadway conditions discussed. However, bicycle route signage is not recommended for wide curb lane treatments on major arterial streets or rural roadways with high traffic volumes and speeds. The preferred treatments are the implementation of bicycle lanes, paved shoulders, or designation of less-traveled alternative routes. If no alternatives exist, “share the road” caution signs may be used as an interim measure until bicycling conditions are improved.

### ROUTE SIGNAGE

As discussed in the Manual on Uniform Traffic Control Devices (MUTCD), published by the Federal Highway Administration of the U.S. Department of Transportation, multi-use trail signs designed to guide cyclists to their destinations should be provided as for bicycle route signs. As such, these guide signs should be placed at decision points along a multi-use trail to inform users of route direction changes and to confirm that route direction has been accurately comprehended. To provide navigational information, supplemental plaques should be used to convey the distance to the desired destination and direction of travel. As desired or deemed appropriate, supplemental plaques may also be placed above or below these signs to identify a specific route by local name.

### REGIONAL TRAIL SYSTEM SIGNAGE

The Manual on Uniform Traffic Control Devices (MUTCD) recommends multi-use trail signage for use where it is desired to establish a unique identification for routes of a regional trail system. Since there are numerous jurisdictions responsible for a regional trails system, logical and meaningful regional trails system identification should be established through the efforts of the Southern Nevada Regional Trails Partnership. The MUTCD allows for variance in sign design where messages other than those provided in the MUTCD are needed. Accordingly, a unique regional signage system should be considered to differentiate long distance routes from routes leading to local destinations only.



*Designation of routes may vary in type depending on the existing conditions at the time*

In certain circumstances, it may prove beneficial to provide even more directional information to bicyclists and multi-use trail users by mapping routes through particularly confusing areas. Appropriate application of such treatment would be:

- Where three or more multi-use trails or bicycle routes converge in one area.
- Where infrequent users may tend to get lost without supplemental navigational information.
- Where placement of standard route signage would be too frequent or confusing.

Regulatory signs give notice of traffic laws or regulations that multi-use trail users must follow. Examples include signs for bicycle lane designation such as “No Parking” signs, “Stop” signs and “Yield” signs. The use of warning signs, which are typically yellow in color, should be kept to a minimum as to not minimize their effectiveness.

As discussed in the MUTCD, regulatory and warning signs may be of reduced size (18" X 18" or 12" X 9") but should be standard size (30" X 30" or 24" X 18") when used for on-street facilities.

As a means of identifying trails, it is also important to provide information on routes and facilities via the internet. Large trail segments should be named, e.g., the Bonanza Trail and the Lone Mountain Trail, and be identified on maps on the internet, at trailheads, and on each trail route.



## BICYCLE PARKING

Cyclists can benefit significantly from expanded and improved bicycle parking. Secure bicycle parking is recognized as one of the first and most important facility improvements necessary to improve the viability of bicycle transportation.

As access is improved to various destinations and bicycling is encouraged, bicycle parking will become an important component of local plans. The City should adopt regulations for the provision of bicycle parking just as requirements for automobile parking are adopted.

Bicycle parking needs vary by type and duration of use and location; however, several factors are common to all acceptable bicycle parking installations:

- Good support of the bicycle;
- Security, i.e. the capacity to lock the frame and both wheels;
- Ease of use;
- Durability;
- Visibility of site;
- Convenience to destination;
- Compatibility with site conditions; and
- Attractiveness.

Several designs cannot be recommended for most public locations. These include racks which do not support the bicycle because they are too close to the ground, are difficult to attach a locking device to, and pose a potential hazard to pedestrians who might trip over them. Other questionable designs include the traditional “school” rack and variations of it. These racks generally support only the front wheel. Bicycles often fall over, and locking the various components of the bicycle requires that the user provide a long chain or cable. There are also racks on the market that do not accommodate all types of bicycles (e.g., the fatter wheels of “mountain” bikes do not fit in some racks).



*Bicycle parking needs to provide security, ease of use, visibility, and attractiveness*

## **LOCATION AND SITING OF BICYCLE PARKING**

Bicycle parking should be sited wherever bicycle traffic is expected. High-priority locations include schools, places of employment, commercial districts, and parks and other recreational facilities. Since six to eight bicycles can be parked in the space needed for one car, consideration should be given to the conversion of parking spaces.

Bicycle parking may also be sited in conjunction with traffic calming strategies. For example, curb bulbs or curb extensions that are placed at intersections or mid-block to function as traffic calming chokers are good locations for bicycle parking facilities.

Because of the many types of bicycle parking facilities on the market, installation is sometimes done incorrectly. It is important that the installer understands how the rack or device will be used so that access is not blocked and facilities are not installed facing the wrong direction.

There are several additional features of a bicycle parking installation that can increase its attractiveness to users. Weather protection in the form of a roof or canopy can greatly enhance any facility. Siting facilities in high-traffic areas or where they are visible to an attendant will improve security. Sometimes the best bicycle-parking program does not involve facilities but rather a change in policy. For instance, commuters would sometimes rather take their bicycles into their work place than park them at a facility. Flexibility and inventiveness can sometimes provide the desired alternative.

Bicycle parking should be provided free of charge. Free parking is an important incentive to bicycling, especially where automobile parking is not free. An exception is for bicycle lockers, which are generally rented. For those who wish to use a locker, its availability upon arrival is often important. Also, the greater cost of lockers, as well as maintenance and administration costs, can be defrayed by rental income.

## **IMPLEMENTATION**

### **TRAILS ESTABLISHMENT AND MAINTENANCE**

Most of the present trails have been established by developers in one of three ways. The first is by the establishment of “no-build” lots to be deeded to the City. No construction or maintenance has been required of the developer in such cases. Consequently, the lots have become eyesores to the neighborhood, since there is no funding mechanism in place to maintain the lots.

The second way trails have been established is with easements across individual lots. The developers have been responsible for their construction; however, because the trails are established as easements, the property owners whose properties they cross are responsible for their maintenance, including the irrigation of plant materials located within landscaped corridors. Trails that have been established outside of perimeter walls are not well maintained, if at all.

The third way trails have been established is by having the trails created as common lots to be perpetually maintained by homeowner's associations or similar organizations of the developments in which they are located. The developer is responsible for their construction, including the installation of perimeter landscaping and its irrigation. Accordingly, staff in the approval of all development proposals that include a trail segment has imposed the following standard condition:

The developer shall reserve a [insert width] foot wide corridor adjacent to, but outside of, the dedicated right-of-way for [insert street name], on the (east/west/north/south) side of the street, for trail purposes in accordance with Map Seven of the Northwest Sector Plan. The trail corridor shall be created as a separate lot or parcel, as a common element, separate from other adjacent common elements, and the developer shall grant a public trail easement overlying the entire area of the common element thus created. Concurrent with development of this site, the developer shall construct trail improvements within this easement corridor in a manner acceptable to the Planning and Development Department and the Public Works Department. Landscaping and other improvements within the trail corridor shall be maintained by the homeowner's association or similar management association of this development. No above-ground utility vaults that would substantially interfere with the use of the trail corridor will be allowed within the easement area.

There will continue to be a heavy reliance in the future on developers to provide trails along with development in locations proposed in the Transportation Trails Element. However, to complete segments of the trails system that provide continuity, the City will need to take on a larger responsibility for trails construction, including the acquisition of property and the planning, design, and construction of these trails. This responsibility should be divided among various departments. The Planning and Development Department should be in charge of determining trail locations. The Public Works Department should be primarily involved in the design of trails as well as the acquisition of trail segments. The Field Operations Department should most likely be responsible for the construction of trails or the inspection of trails constructed by others.



*Trail construction projects that have the potential for the greatest amount of usage and functionality should be the highest priority*

Maintenance of the trails system primarily involves the removal of debris and the repair of trail components. Maintenance also includes the continued irrigation and replacement of trail plantings within the landscaped corridors. Because there is presently no formal trails maintenance program in place, the Trails Element recommends that three groups eventually assume responsibility for maintenance of the trails system. The three groups are discussed as follows.

- Regional trails agency. Much of the City's trails system would become part of a regional facility involving other entities, including Clark County, Henderson and North Las Vegas. The regional portion of the trails system could come under the jurisdiction of the valley-wide Regional Transportation Commission or of an agency similar to it. The agency would be responsible for maintenance and repair of the regional trails system.
- City division. A separate division of a City department could be organized to design, oversee, and help maintain part of the trails system. Funding sources for this division would come from the general fund or from other sources discussed later.
- Non-profit organization. Private interest groups have indicated a willingness to assume responsibility for the maintenance of specific trails. Trail advocates could create a non-profit organization to plan, oversee, and help maintain these trails segments. Funding sources for this organization would come from private or other sources which will be discussed later.

The City is not in a position to assume responsibility for the maintenance of a trails system at this time. Reliance on the development community, homeowner and maintenance associations, and non-profit organizations for the maintenance of trails is essential.

## FUTURE TRAIL PROVISIONS AND MAINTENANCE

Based on the objectives and recommendations of the Trails Element, trails will be provided in conjunction with development by the developer, except as otherwise noted below. In addition, the ownership, maintenance and repair or replacement of the trails and trail segments will be as follows:

- Trails include paths and transition strips / landscaped corridors (see definition of terms). The trail path is to be established as a lot and dedicated to the City as a transportation trail path.
- The irrigated landscaped corridor(s) is to be owned by an adjacent maintenance or homeowners association.
- The transition strip is to be located within the street right-of-way.
- The trail, including the trail path and transition strip / landscaped corridor, is to be established by the developer.
- The trail, including the trail path and transition strip / landscaped corridor, is to be maintained and repaired by an adjacent maintenance or homeowners association.
- A public access easement is to extend across all private sections of the trail corridor, including all private street and drive intersections that the trail crosses, and be granted to the City.

Table #3 outlines the various types of trails and which groups will be responsible for the provision of trails and their ownership, maintenance, and repair or replacement. Trails that are provided ahead of development or retrofitted in existing developments must be owned, constructed and maintained or repaired by the City or some other entity.



*Multi-use trails and pedestrian pathways enhance a given corridor and encourage increased use*

**TABLE 3. PROVISIONS FOR TRAILS IN CONJUNCTION WITH DEVELOPMENT**

TRAIL TYPE	SEGMENT	OWNERSHIP	CONSTRUCTION	MAINTENANCE	REPAIR/REPLACE
MULTI-USE TRAILS	Path	City	Developer	Homeowners Association/ Maintenance Organization/ Adjacent Property Owners	Homeowners Association/ Maintenance Organization/ Adjacent Property Owners
	Landscaped Corridor	Homeowners Association/ Maintenance Organization/ Adjacent Property Owners	Developer	Homeowners Association/ Maintenance Organization/ Adjacent Property Owners	Homeowners Association/ Maintenance Organization/ Adjacent Property Owners
PUBLIC RIGHT-OF-WAY	Sidewalk	City	Developer	Homeowners Association/ Maintenance Organization/ Adjacent Property Owners	Homeowners Association/ Maintenance Organization/ Adjacent Property Owners
	Transition Strip	Homeowners Association/ Maintenance Organization/ Adjacent Property Owners	Developer	Homeowners Association/ Maintenance Organization/ Adjacent Property Owners	Homeowners Association/ Maintenance Organization/ Adjacent Property Owners



# FUNDING

## INTRODUCTION

The Finance and Business Services Department and its Treasury Division administer the funding sources required for any trails establishment and operations by the City. Trail revenue sources previously had been included with park revenue sources. Since the City has only three major trail segments that are used, minimal funding for maintenance has been budgeted. Therefore, no budget trends for trails can accurately be extrapolated. Additional trail funding will need to be programmed from existing revenue sources and from potential new sources. Existing revenue sources primarily include bonds and the general fund. Alternative funding sources are discussed later.

## ANALYSIS OF OFF ROAD CONSTRUCTION COSTS

The Architectural Services Section of the City Engineer Division has estimated the cost for the construction of trails meeting the trail standards in this Trails Element. These costs are shown in Table #4 and expressed in costs per 100 linear feet for multi-use trails. These cost figures are used to determine the overall development costs for a complete trails system. These figures do not include such items as trail signs for information and traffic control, bike racks, electrical service, drinking fountains, telephone service, and hitch rails that may be needed on a case-by-case basis, depending upon the type of trail. Trail heads with vehicle and trailer parking, signage, information centers, sponsor material, maps, benches, shade, and hitching rails/posts are additional expenses that may be incorporated in parks that interconnect with the trail system.

There are approximately 55 miles of planned trails illustrated on Map #2, Map #6, and Map #9. Without accounting for land acquisition or inflation, the approximate construction costs of these trails, if the City were to construct them, would be \$26.8 million for multi-use trails. Most of these development costs would be borne by developers as a condition of development approval. [The numbers in this paragraph will change, pending a final determination of the exact trail routes.]

# TABLE 4. TRAIL COSTS

ITEM	COST/UNIT	MULTI-USE COST/UNITCOST/100 FT. (20 FT. WIDTH)
Site Grubbing (8 in. depth)	\$8.00/cu. yd.	\$395.06
Landscaping Soil (4 in. depth)	\$12.00/cu. yd.	\$148.15
Grading (landscaped area)	\$0.07/sq. ft.	\$70.00
24 in. Box Trees	\$300.00	\$1,500.00
15 gal. Shrubs	\$85.00	\$850.00
5 gal. Shrubs	\$30.00	\$300.00
Irrigation Emitters	\$12.00	\$1,080.00
Pre-emergent Herbicide	\$0.03/sq. ft.	\$30.00
Decomposed Granite	\$0.45/sq.ft.	\$450.00
Stabilized Decomposed Granite	\$0.60/sq. ft.	\$600.00
Chat	\$0.125/sq. ft.	NA
Portland Cement Concrete	\$3.50/sq. ft.	\$3,500.00
Trash receptacle	\$500.00	\$125.00
Bench	\$800.00	\$200.00
Lighting, Pole & Fixture*	\$2,500.00	\$1,650.00
Fence, PVC	\$5.00/ft.	NA
<b>Subtotal</b>		<b>\$10,898.21</b>
Mobilization	Subtotal x 4%	\$435.93
Bonds and Insurance	Subtotal x 4%	\$435.93
Contractors' Overhead & Profit	Subtotal x 10%	\$1,089.82
Contingency	Subtotal x 10%	<u>\$1,089.82</u>
<b>Total</b>		<b>\$13,949.71</b>

\* This cost would be reduced in those instances where backside luminaries are mounted on existing street lightpoles.

Since developers are responsible for the construction of most trails within new developments, the City should focus on constructing trail segments in existing and future developed areas that are necessary to complete major sections of the trails system. This will entail constructing some segments across undeveloped parcels and retrofitting other trail segments on development parcels. The actual cost to the City for trails construction depends in large part on how aggressively the City wants to complete major sections of the trail system. If the City chooses to complete trail segments that would otherwise be constructed by a developer in due course, then the cost to the City would be much higher. The amount of funds set aside for trails development will be balanced against other funding programs when developing the capital improvements program and the capital budget.

If, for discussion purposes, it is assumed that 90 percent of the trails system will be constructed by developers, then over the next 20-year time period or until the trails system is completed, it is estimated the City could be responsible for the construction of \$2.7 million for multi-use trails.

## **FUNDING SOURCES**

The City can obtain funds for trails development, including acquisition and construction, from a range of sources. These revenue sources include the following:

### **GENERAL FUNDS**

Some funds are made available for transportation purposes from moneys collected by way of general fund augmentation. These funds are City revenues generated from a variety of sources that have not been used for other purposes. It should be noted that these funds are limited and are subject to highly competing demands.

### **GENERAL OBLIGATION BONDS**

General obligation bonds require the full faith and credit of the City, which necessitates approval by the voters at a general election. The bonds are repaid by an automatic lien on an identified existing revenue source.

### **GIFTS**

Gifts of land or money designated for trails purposes are a source of funding, but such gifts are often fettered and restricted; contributions in return for the privilege of naming a trail to recognize a benefactor must follow approved City policy with respect to naming such facilities.

## GRANTS

The Bureau of Land Management (BLM) has funds set aside for trails. The Southern Nevada Public Lands Management Act of 1998 allows for money from the sale of BLM land to be expended for “. . . development of parks, trails, and natural areas in Clark County, Nevada, pursuant to a co-operative agreement with a unit of local government.” [Section 4(e)(3)(A)(iv)] This funding source is the most promising single source of funds available for trails construction.

The federal government has established several other programs that offer grants for trail development. The Transportation Equity Act for the 21st Century (TEA-21) establishes several funding programs for the construction of trails listed as follows:

- National Scenic Byways. This funding program is administered by the Nevada Department of Transportation.
- CMAQ Grants. The local Regional Transportation Commission (RTC) administers CMAQ grants.
- STP Enhancements. Money from these grants, administered by the RTC, must be used for transportation purposes.
- Land and Water Conservation Fund Program provides 50:50 matching grants to states and through states to local governments for trails acquisition and development.
- Other grant sources include RTC Assistance funding that is available from regional offices of the National Park Service and Urban Resources Partnership funds, administered locally by the Clark County Conservation District.

## FUND RAISERS

Fund raising is a potential source of funding that is generally used more for a specific trail development than land acquisition. Its availability, however, is limited and unreliable.

## PUBLIC/PRIVATE ARRANGEMENTS

It is recommended that public/private arrangements be encouraged, provided that free access to the facility or development in question is made available to the general public.

## REVENUE BONDS (MEDIUM-TERM OR LONG-TERM)

Revenue bonds do not require voter approval since there is identified a dedicated revenue stream to repay them. The bond is to be repaid within a 10-year horizon.

## **SPECIAL IMPROVEMENT DISTRICTS**

With approval of more than 67 2/3 percent of the persons who benefit, a special improvement district could be established to finance the construction of trails.

## **TAX INCREASES**

Tax increases provide a dedicated and immediate funding source. Tax increases, however, may only be imposed by a majority vote of the electorate.

## **USER'S GROUPS**

Several groups have expressed interest in creating an "Adopt a Trail" program to help with the maintenance of trails. This could be done at little or no cost to the City.

## **USER FEES**

User fees could be assessed to persons who are expected to benefit from use of the trails. Examples include: bicycle registration fees; license fees for horses, similar to dog license fees; and horse trailer fees.

## **FUNDING PRIORITIES**

### **GENERAL**

The Trails Element includes an assessment of trail needs and demands for the community presently and for the future. Proposed trail alignments are presented on Map #1, Map #5, Map #7 and Map #8. Because of limited financial resources, funds for trail projects must be prioritized on a year-by-year basis as part of the capital improvements program. While maintenance is not considered a capital cost, it is very important to ensure that a trails system is kept functional. Therefore, the prioritization of funding for trails must be carefully balanced between capital projects and maintenance in each of the following categories:

- Priorities for the acquisition of land for trails.
- Priorities for new trails construction.
- Priorities for the ongoing maintenance and repair of existing trails.



## **ACQUISITION PRIORITIES**

Trails within the city traditionally have been established as a condition of development approval. In most cases, the developers of commercial and/or residential properties provide trails as an amenity of the development. This practice has generally been successful in providing many of the trails that now exist in the community. However, other alternatives for trail acquisition and construction should be investigated to acquire property and construct trails in those areas of the community that are fully developed and to connect them to the rest of the trails system. Accordingly, a high priority should be given to the acquisition of property for a trail that provides an important link to an established trail system or that is about to be developed for other purposes.

### **Bike Routes**

The acquisition of land for bike routes is needed only in those instances necessary to remove route “hazards” and should receive the highest priority, since bike routes have the greatest functional value, serving transportation functions. In addition, the cost for hazards removal is relatively low.

### **Multi-Use Trails**

Multi-use trails, that are intended for both pedestrians and bicyclists, are a medium priority, since they generally are eventually established as a part of development.

### **Greenways and Beautification Areas**

Landscaped roadway perimeters, medians and roundabouts and linear green spaces are intended primarily for aesthetic purposes or as drainage ways. They can provide important areas of open space and for the construction of trails within them. Such areas are, however, generally acquired for other purposes, so there is less need to acquire them specifically for trail purposes.

## **CONSTRUCTION PRIORITIES**

The construction of trails should generally be prioritized in the same manner as for trail acquisition priorities, i.e. trail construction projects that have the potential for the greatest amount of usage and functionality should be the highest priority. The construction of trails that enhance the connectivity of the trail system by extending an existing trail should be a high priority.

## **REPAIR AND MAINTENANCE PRIORITIES**

The timely maintenance and repair of developed trails is a high priority. However, funding for this purpose must be carefully balanced with capital projects. For example, if the construction of a new trail provides an important link in the trail system, then repairs of the trail system may need to be deferred, pending the availability of additional funding. Enough funding should be budgeted annually, separate from capital projects, to keep the trail system in operation.

### **PRIORITY SUMMARY**

From the discussion above, high, medium and low priorities are outlined as follows:

#### **High Priority**

1. Acquire property for trails that is about to be developed for other purposes and where no accommodation for trails has been made.
2. Remove hazards to designated bikeway routes
3. Acquire property for trails where they provide an important link in the trail system
4. Construct trails where they provide an important link in the trail system
5. Repair the existing trail system
6. Maintain the trail system in good condition

#### **Medium Priority**

1. Acquire property for multi-use trails
2. Construct multi-use trails

## SELECTION SYSTEM

To assist in prioritizing capital projects for funding, particularly among projects that have the same level of priority, a priority selection system is suggested. Listed below are criteria developed from the priorities discussed above. The criteria are assigned points based upon their relative importance to the trails system. Every project is then evaluated on the basis of the total number of points from those criteria in the list that the project meets and compared to other projects. Projects that score the highest number of points are given priority for funding, in ranking order. This classification system should only be used to assist in prioritizing trails projects; there may be other reasons for selecting one trail project over another, including previous commitments, funding availability, timing, and other factors.

- Acquire property for trails that is about to be developed for other purposes and where no accommodation for trails has been made (3 points)
- Acquire property for trails where they provide an important link in the trail system (3 points)
- Acquire property for multi-use trails (2 points)
- Construct trails where they provide an important link in the trail system (3 points)
- Construct multi-use trails (2 points)
- Remove hazards to designated bikeway routes (3 points)
- Repair the existing trail system (3 points)
- Maintain the trail system in good condition (3 points)
- Repair the existing trail system (3 points)

## CAPITAL IMPROVEMENTS PROGRAM

The City's capital improvements program (CIP) contains funding for based on a five-year horizon, which is updated annually. No trails are identified for funding.

It is recommended that trails requiring capital expenditure be closely coordinated through the CIP so budgeting and trails planning priorities can be linked logically and efficiently. The Trails Element provides a plan and implementation strategy for the establishment of a trails system. It is not intended to provide a list of trails for funding in the CIP or to establish a budget for the projects selected for funding. Consequently, the next step in the implementation of a trails system will be to compose a prioritized list of projects, using the criteria established in this plan.